UNIVERSITY OF ARIZONA
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National irrigation congress.

Proceedings.

16th

1908

SIXTEENTH NATIONAL IRRIGATION CONGRESS

OFFICIAL SOUVENIR
ALBUQUERQUE, NEW MEXICO, U.S.A.

St. Louis, Rocky Mountain & Pacific Co.

Raton, New Mexico.

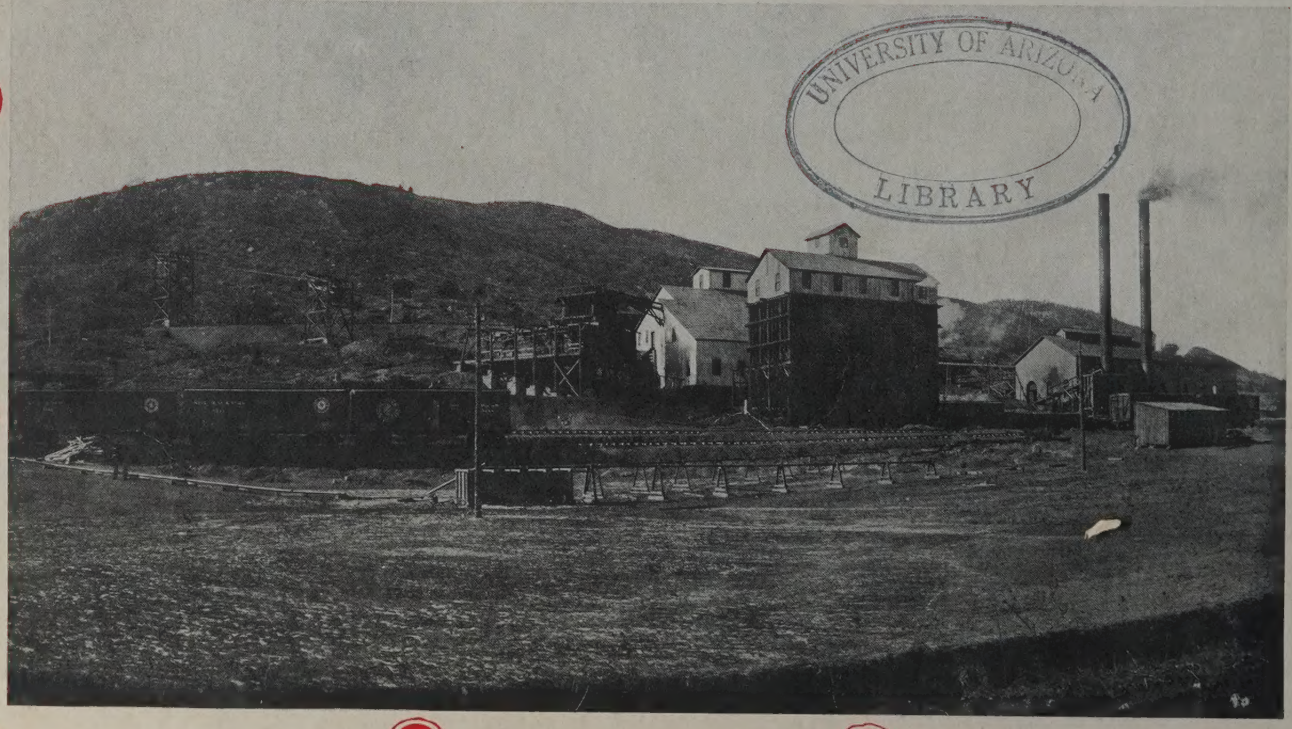
COAL MINES

KOEHLER
VAN HOUTEN } NEW MEXICO
BRILLIANT

Coal and Coke

COKE OVENS

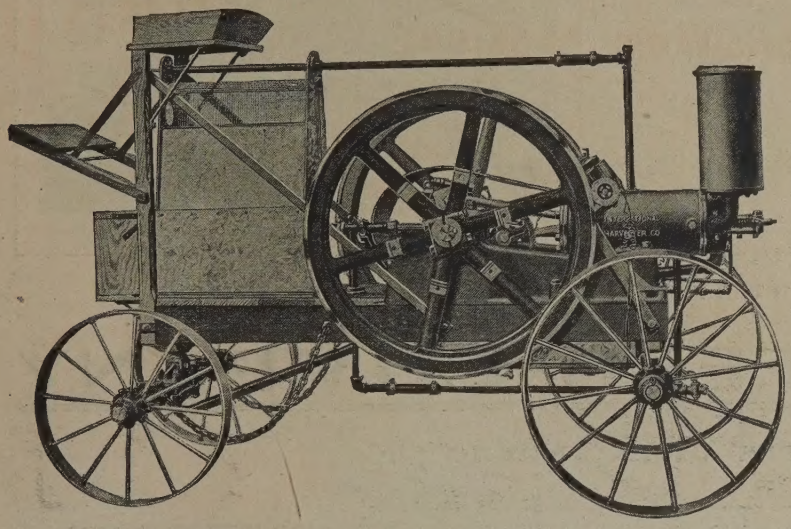
GARDINER } NEW MEXICO
KOEHLER



UNIVERSITY OF ARIZONA
LIBRARY

Labor Saving, Expense Reducing Power for Every Farm

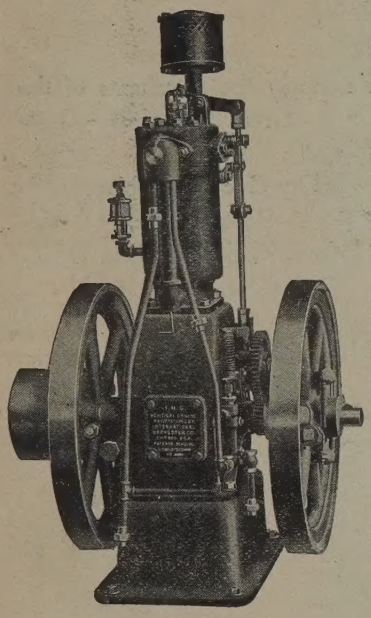
FARM PROFITS, as every farmer knows, are in proportion to the cost of production, consequently when work is done with the least expenditure of time and money, the maximum profits are realized. Big crops may be grown, but if they cost all of their market value to produce them, the work has been in vain.



An I. H. C. Gasoline engine—the power for all farm purposes where mechanical power can be used—reduces labor and expenses to the minimum.

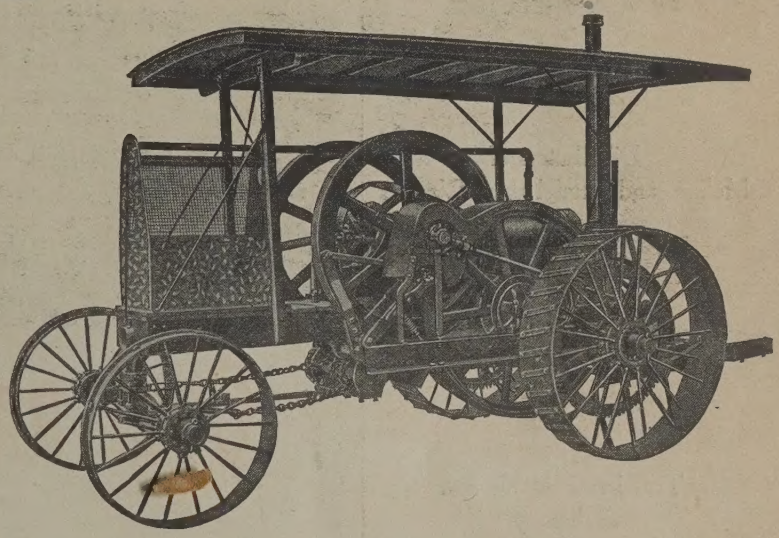
For those who wish to irrigate by pumping, the I. H. C. gasoline engine is the best power. The difference between success and failure in an irrigation pumping plant is often a question of fuel. The I. H. C. gasoline engine takes the least fuel and converts it into the most power. It is unequalled where steady power is required as in pumping, and it sustains the full rated power. It can be belted to any centrifugal or direct pump for lifting water from wells, canals, streams, etc. Anybody can run it without expert knowledge or previous experience. This engine may be set in motion and left for hours at a time.

Ideal for Every Farm Power Requirement



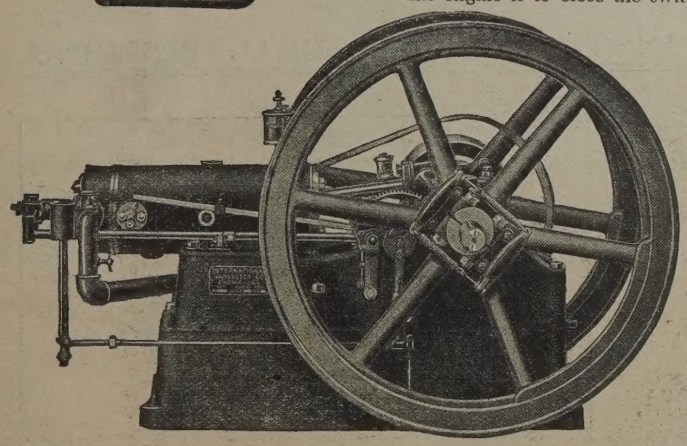
The International Harvester Company gasoline engine is just as efficient for all farm power requirements as it is for irrigation purposes.

There is no power that equals this engine to pump water for stock — wind power cannot be depended upon and hand power is out of the question entirely.



This engine will run the feed grinder so that alfalfa and other feed can be ground with ease and satisfaction by one man.

For saw mills or for threshing, an International Harvester Company gasoline engine will be found to be perfection itself—no fuel and water to haul, no waiting to get up steam. All that is necessary to start this engine is to close the switch, open the fuel valve, give the fly wheel a turn or two by hand, and away it goes doing the work at a cost so small that it is never a source of worry.



The International Harvester Company gasoline engines are made in the following styles and sizes, among which you will find a power to meet your every requirement, and to do your work with the least possible expense.

Vertical 2 and 3-horse power.

Horizontal (Portable and Stationary) 4, 6, 8, 10, 12, 15, and 20-horse power.

Traction 10, 12, 15 and 20-horse power.

Tom Thumb 1-horse power air cooled.

Also, sawing, spraying and pumping outfits and ja

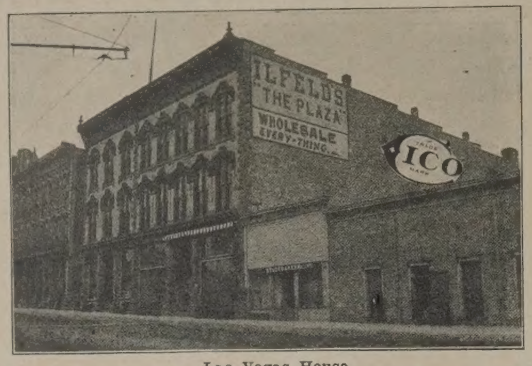
These engines are sold by local agents everywhere, w you prices and give you the information you desire

If you prefer, write us direct for catalog a matter.

INTERNATIONAL HARVESTER COMPANY OF AME

Chicago, U. S. A.

87684



Las Vegas House.

New Mexico's
Largest
The Southwest's
Greatest
Wholesale House

Albuquerque House.

GREETS YOU AND BIDS YOU WELCOME TO THE SIXTEENTH NATIONAL IRRIGATION CONGRESS

CHARLES ILFELD COMPANY

Wholesalers of Everything

ESTABLISHED, 1865

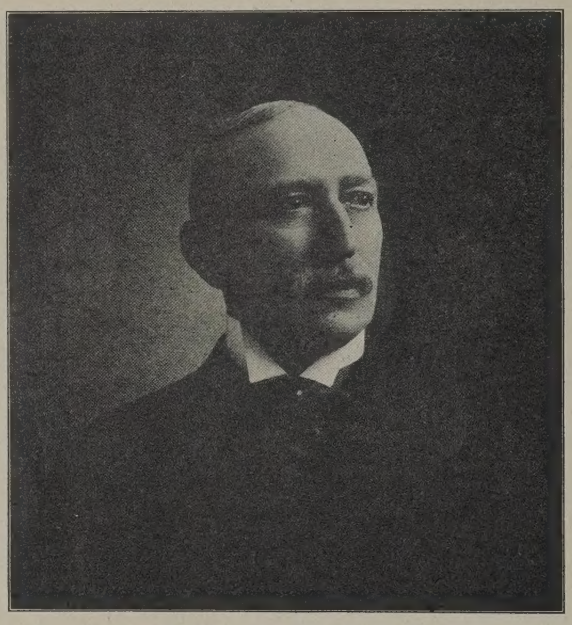
Distributors of
Moline and Studebaker Wagons

John Deere Implements

McCormick, Deering
and Champion Machinery

Eclipse and Fairbanks
Windmills

Traction, Portable and
Stationary
Gasoline Engines



CHARLES ILFELD, Founder of the Company.

INCORPORATED, 1906

We supply the merchants of this
Great Southwest
with
Dry Goods, Clothing,
Boots, Shoes,
Notions, Millinery, Hats, Caps,
Furniture, Hay, Grain,
Groceries,
Hardware of every description,
Guns and Ammunition,
Harness, Saddlery,
Crockery, Tinware, Cutlery,
Stoves, Ranges, Etc.

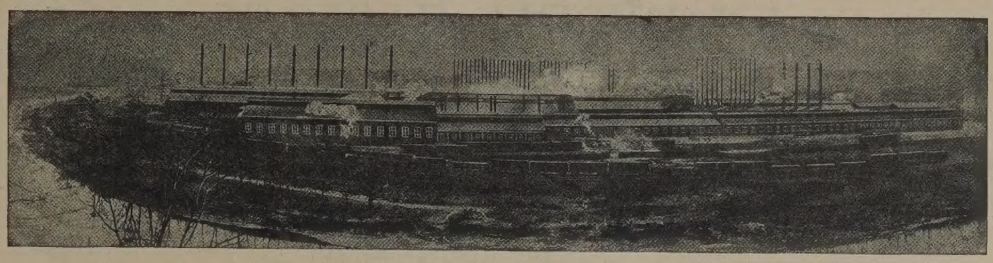
DO NOT FAIL TO SEE OUR EXHIBIT IN THE AGRICULTURAL BUILDING.

Vegas Warehouse

STORES
at
LAS VEGAS,
ALBUQUERQUE
and
SANTA ROSA,
NEW MEXICO

TRADE
ICO
MARK

The Brand of Merit



Vandergrift Works, Vandergrift, Pa. Largest Sheet Mill in the World.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

MANUFACTURERS OF

SHEET AND TIN MILL PRODUCTS

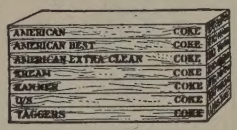
Our thirty-seven plants enable us to meet promptly every demand for Sheet and Tin Mill Products, and in addition to the brands shown below, we make a specialty of Electrical Sheets, Corrugated Sheets, Plain and Rock Face Brick Siding, Rock Face Stone Siding, Weatherboard Siding, Beaded Ceiling, V Crimped Roofing, Pressed Standing Seam Roofing, Ridge Roll and Capping, and Continuous Roofing (valley tin). We also furnish Black sheets of all descriptions for forming or manufacturing purposes. Our Blued Stove Pipe Stock is superior to any material of the same price on the market.

AMERICAN OLD STYLE AAA 30 POUNDS COATING

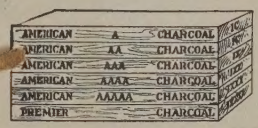
AMERICAN IC 8 POUNDS COATING

AMERICAN EXTRA 12 POUNDS COATING

AMERICAN OLD STYLE AA 25 POUNDS COATING



AMERICAN SHEET & TIN PLATE CO. APOLLO BEST BLOOM TRADE MARK REGISTERED PITTSBURGH



"APOLLO BEST BLOOM" Galvanized Sheets

Our Formed Roofing and Siding Materials can be furnished plain, painted or galvanized, as desired. The plain and painted bear the stencil "American," the galvanized "Apollo."

All our brands of Roofing Tin bear the weight of coating stamped plainly in the corner of every sheet. When you specify a certain weight you see that you get exactly what you pay for.

Our REFERENCE BOOK containing information and tables invaluable to users of sheet metal, galvanized sheets or tin mill products will be mailed you upon request. For further information address nearest Sales Office.

DISTRICT SALES OFFICES.

W. H. Eaton,	Commercial Nat. Bank Bldg, Chicago, Ill.	Frank Dickerson,	Hudson Terminal Building, N. Y. City
W. T. Shannon,	Union Trust Bldg., Cincinnati, Ohio.	H. M. Davis,	Pennsylvania Building, Philadelphia, Pa.
E. M. Sparhawk,	Equitable Building, Denver, Colo.	R R. Hoge,	Wells-Fargo Building, Portland, Ore.
Jas. A. Smith, Jr.,	Penobscot Building, Detroit, Mich.	I. B. Williams,	Crocker Building, San Francisco, Cal.
Jas. R. Mills, Jr.	Maison Blanche, New Orleans, La.	W. J. Wetstein,	Third Nat. Bank Bldg., St. Louis, Mo.

Jos. R. Bates, Frick Building, Pittsburgh, Pa.

A MAMMOTH CAR LOAD OF

JOHN DEERE GOODS

Will be on Display September 29 to October 10, 1908

ALBUQUERQUE, N. M.

AT THE

SIXTEENTH NATIONAL IRRIGATION CONGRESS

AND

The International Industrial Exposition.

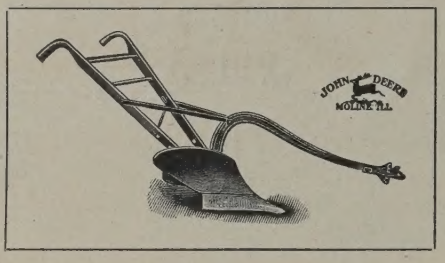
JOHN DEERE

Made the first plow. Many have tried to imitate. Many have failed. None have succeeded.

JOHN DEERE still heads the list with 67 years of knowing how. Experienced men will be in charge of our display, and we extend to all an invitation to visit us at this time, and we will take great pleasure in showing you the best manufactured Implements, Vehicles, wagons, etc.

The following are a few of the things we handle:

Disc Harrows
Farm Mills
Farm Trucks
Feed Cookers
Feed Mills
Gasoline Engines



Western Plows
Chilled Plows
Subsoil Plows
Grading Plows
Hillside Plows
Root Ground Plows

Harrows
Hay Loaders
Horse Powers
Listers
Manure Spreaders
Sprayers

Potato Diggers
Pumping Engines
Rakes, Scrapers
Seeders, Stakers
Sulky Listers
Stalk Cutters

CREAM SEPARATORS
CORN PLANTERS
CORN HARVESTERS
CORN SHELLERS
CULTIVATORS
DISC CULTIVATORS

New Ground Plows
Breaking Plows
Road Carts
Road Wagons, Buggies
Surries, Phaetons
Spring Wagons

Moline Mountain Wagons
Ft. Smith Mountain Wagons
Wheel Scrapers
Field Rollers
Hoosier Drills
Corn Mills

JOHN DEERE PLOW COMPANY,

OKLAHOMA CITY, KANSAS CITY, DENVER, COLO.

¶NO MOVEMENT LOOKING TO THE CONVERSION of Lands for the uses and support of humanity has ever taken place without the aid supplied by that common-place, yet indispensable contrivance known as the AMERICAN FARM WAGON.

It has ever been a potent factor in the development of new country.

It is the farm wagon that carried the sturdy pioneer in his over-land journey to his conquest of new lands. Modestly but surely it has forced its way onward, overcoming difficulties of every sort, signalling its progress by the cheerful chuck of its wheels.

It has been the reliable helpmate of man in redeeming the arid regions and reducing the waste lands to crop-growing productiveness.

Without the farm wagon the marketing of the earth's products cannot be effected.

It hauls the material to build the hut or the palatial residence.

Nothing can take its place to bring to place the equipment and material for building our railroads.

Its services, therefore, are absolutely essential to our very existence.

It is truly "the vehicle of civilization," this American Farm Wagon.

No wagon among wagons has contributed a larger share to all this important work than the MOLINE.

THE NEW MOLINE

Since 1854 there has been furnished about a million of these wagons to the pioneers and farmers of this country, whose demands, constantly growing, have raised this factory from a small hand wagon shop to the present enormous dimensions producing annually about 30,000 complete wagons, or 100 a day of ten working hours, which is equivalent to a complete wagon every six minutes.

The MOLINE is the highest possible attainment in the manufacture of farm wagons. It is constructed of material embodying the best grades of hardwoods—oak and hickory—on a design entailing greater use of ironing than has heretofore been employed in the building of farm wagons and finished with the best paints and varnish, enabling us to give the American people a product of the GREATEST DURABILITY, EXTREME UTILITY and UNUSUAL LIGHT DRAFT.

We issue a booklet entitled "How the NEW MOLINE is made Iron Clad." An excellent source of information on the construction of an UP-TO-DATE farm wagon. We send out copies of this *booklet free.*

MOLINE WAGON CO.,

CHARLES ILFELD COMPANY,

Mfg'rs Agents

Las Vegas, Albuquerque, Santa Rosa,

NEW MEXICO

The Ohio Match Company

SENDS GREETINGS TO **THE NATIONAL IRRIGATION CONGRESS**

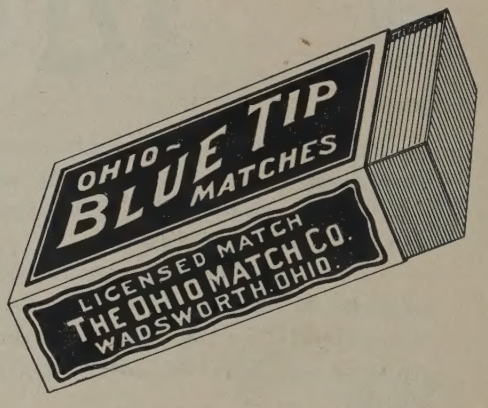
WITH the motto that "The Best is None Too Good," THE OHIO MATCH COMPANY begun the manufacture of matches twelve years ago and today has a factory costing One Million Dollars, equipped with electric power throughout and the best machinery of its kind known to the world. Our Parlor Matches:—The Ohio, King Bird, Radium, Chippewa, Wigwam, Household, and others are judged to be in every way equal to the best. Our Blue Tipped safe-head matches have no equal. This double dip match receives words of the warmest commendation from those interested in Fire Protection. Herein follows an extract from a recent report made to the National Fire Protection Association by G. P. Davis, Chairman of the Committee on Matches:

"The Double Dip Match is a recent invention, and is the combining of two Match heads, of directly opposite characteristics, into one; that is, the split is first dipped into a composition similar to that used in the safety Match, and the second dip is similar to Sulphur Match composition.

We believe it has redeeming features that deserve creditable mention, such as, the head will not fly, a frictionless collar protects the sensitive phosphorus tip, rough handling of packages is not liable to cause ignition. An exception of this statement should be made in the case of a Double Dip Match using phosphorus throughout."

The "OHIO" Double-Dip MATCHES

Blue Tip, Grand Noiseless, Desk,
Ohio Noiseless, Riverside Noiseless,
Dark Blue Head, Light Blue Tip,
Pink Head, Blue Tip.



Characteristic qualities:—All the good things said above by Mr. G. P. Davis.

With a capacity of 200,000,000 matches per day,—two matches daily for every man, woman and child of our Great Nation, we are able to take excellent care of our friends whom we cordially invite to call at our plant when in this vicinity. It goes without saying that we are best known east of the Mississippi; but many good jobbing houses west of that river—even to the Rockies, are now selling our matches and have no doubt of our ability and our desire to give them the best service possible to be had. They say BETTER matches can NOT be had from any other, and that

The Ohio Match Company Is The Best

The Gold of the Sangre de Cristo Mountains

NOT SINCE the report by U. S. Geologist, F. V. Hayden, upon the geological survey of the ROCKY MOUNTAINS, which he undertook by direction of the Honorable, the Secretary of the Interior, J. D. Cox, which survey covered COLORADO, NEW MEXICO and additional Territory, has there been A MORE IMPORTANT ANNOUNCEMENT in relation to MINERALIZED LANDS than the one herein made.

VAST MINERAL RESOURCES have been lying dormant for many years in NORTHERN NEW MEXICO.

A few attempts have been made here and there, with crude methods, and RICHLY REWARDED.

Such mines as the Aztec, the Montezuma, Rebel Chief, Contention and the Red Bandana Group are known to many readers; but owing to inadequate railway facilities mines in these districts have remained almost unknown. Although claims were located under difficult rules and the mining attempted was of a surface or prospecting character, still prospects sold at good prices in many instances. One, the HARRY BLUFF, sold for $10,000 cash. While only a few mines are mentioned, still it may safely be asserted that at least two hundred and fifty persons have availed themselves of the locating privilege, even under the rules which existed in the past.

ALL THIS HAS NOW CHANGED and great possibilities are expected.

TWO RAILWAY LINES have been built to within 6 to 8 miles of these districts and the old rules have been abolished.

The St. Louis, Rocky Mountain and Pacific Railway and the Cimmarron Northwestern Railroad both penetrate the districts and Hugo Seaberg of RATON, NEW MEXICO, has secured control of the MINING DISTRICTS.

MINERAL LAND SCRIPT is now being sold by him, by using which a mining claim may be secured (300 to 1500 feet) through the ownership of Script and a location of the same in accordance with methods indicated.

THIS SCRIPT IS SOLD at a comparatively NOMINAL PRICE, and being by contract LIMITED IN QUANTITY, the time is not far distant when the Script will sell AT FABULOUS PRICES.

Under conditions as they now obtain a few persons may combine, BUY SOME OF THE SCRIPT, and send out a PROSPECTING PARTY. When a RICH LOCATION has been DISCOVERED, all the surrounding property may be QUIETLY LOCATED with similar Script.

VISITORS and DELEGATES to the 16th National Irrigation Congress and THE INTERNATIONAL INDUSTRIAL EXPOSITION, to be held at Albuquerque, New Mexico, September 29th to October 10th, 1908, may obtain FURTHER PARTICULARS at the COLFAX COUNTY BUILDING on the EXPOSITION GROUNDS or may secure FULL INFORMATION at the PERMANENT HEADQUARTERS in RATON, NEW MEXICO.

AGENTS appointed and exclusive representation assigned.

HUGO SEABERG, Raton, New Mexico.

The CITY OF RATON—The GATE CITY. A few lots within the city limits, in Additions and Acre property, at ATTRACTIVE PRICES.

INCOME PROPERTY netting 12%; loans netting 8% on good inside property. Also farm loans.

LAND SCRIPT for use on NON-MINERAL PUBLIC LANDS. A QUARTER OF A MILLION ACRES bought and sold. WRITE for INFORMATION and CIRCULARS.

INTERESTS in GOOD MINES for sale to persons who will want SMALL AMOUNT OF CAPITAL for DEVELOPMENT PURPOSES.

CORRESPONDENCE relative to INVESTMENTS is solicited.

HUGO SEABERG, Raton, New Mexico

AMERICAN LUMBER COMPANY

ALBUQUERQUE, NEW MEXICO

Manufacturers of

WHITE PINE

LUMBER

Sash Door Ceiling Siding Flooring
Moulding Lath Shingles Balusters
Box Shook

TWENTY MILLION FEET CARRIED IN YARD

Cut Stock of All Kinds - - We Sell to Dealers Only

AMERICAN STEEL & WIRE CO.

Chicago, New York, Worcester, Denver, San Francisco

MAKER OF

AMERICAN FENCE
ELLWOOD FENCE
AM. WIRE ROPE

AND

WIRE OF EVERY DESCRIPTION, round, flat, square, triangular, and odd shaped. Music wire. Mattress, broom, weaving and market wires in all finishes. Special wires adapted to all purposes.

WIRE HOOPS, for use on lime barrels, sugar, salt, produce, apple, cracker, cement and flour barrels and other slack cooperage.

ELECTRIC WIRES AND CABLES, of all kinds, bare and insulated.

TELEGRAPH AND TELEPHONE WIRE. Pole steps.

RAIL BONDS, for electric railroads.

WIRE ROPE, Heavy cable and hawsers; Elevators and tramways, dredging and derrick ropes, ships' rigging, extra flexible rope, sash cord and clothes lines.

BALE TIES, for baling hay, straw, flax, and all kinds of fibrous materials; also for bundling lumber, mouldings, staves and heading.

NAILS, STAPLES, SPIKES AND TACKS of all kinds. Standard wire nails in all sizes and shapes. Miscellaneous fine nails. Wire brads. Tacks in count and weight packages. Dowel pins. R. R. spikes.

BARBED WIRE, both two and four point, Glidden, Baker, Perfect, Ellwood, Waukegan. Lyman and Iowa brands.

WOVEN WIRE FENCING. "America," "Ellwood," and "Royal" fences.

CONCRETE REINFORCEMENT for buildings, bridges, sewers, water mains, columns, walls, stacks, power plants and other concrete work requiring steel reinforcement.

SPRINGS, Clock, motor, car, furniture, agricultural and all kinds of fine and heavy springs.

SULPHATE OF IRON, for water purification; for fertilizing; for chemicals, disinfectant, dyeing, purification of gas, for plate glass polishing, and for wood preservative.

POULTRY NETTING, galvanized before weaving. All meshes and sizes.

WIRE RODS of open hearth and bessemer steel.

HORSE SHOES, "Juniata" brand, iron and steel, in all sizes and patterns. Also toe calks.

SHAFTING, COLD DRAWN STEEL, free cutting screw steel, pump rods. Roller bearing rods, rounds, squares, hexagons, flats and special shapes.

Southwestern Savings, Building and Loan Association of Las Vegas

New Mexico

ORGANIZED MAY 1, 1899

Authorized Capital . $2,500,000.00

A SAVINGS INSTITUTION

A HOME BUILDER

AN INVESTMENT

ASSETS		LIABILITIES	
First mortgage, stock loans and securities	$231,969.40	Class "A" stock	$ 8,156.00
Furniture and fixtures	611.45	Class "B" stock	13,900.00
Cash on hand	883.61	Class "C" stock	1,946.12
Real estate	1,660.83	Class "D" stock	1,355.40
		Class "E" stock	810.75
		Class "F" stock	189,157.89
		Bills payable	10,000.00
		Undivided profits	9,799.13
	$235,125.29		$235,125.29

We Pay 6 Per Cent. For Time Money

We Pay 5 Per Cent For Money, Open Account, Left 6 Months or Longer

Receive Monthly Stock Payments of Any Amount

LOAN MONEY ONLY ON FIRST MORTGAGE REAL ESTATE

HOME OFFICE . . EAST LAS VEGAS, NEW MEXICO

Agents and Collectors

N. E. STEVENS . . General Agent, Albuquerque
R. H. McCUNE . . Special Agent for Pecos Valley

Albuquerque	W. J. Johnson
Artesia	A. C. Keinath
Carlsbad	Clarence Bell
Clayton	Howell Earnest
Deming	James E. Irvine
Hagerman	John I. Hinkle
Portales	J. A. Fairly
Raton	T. D. Leib
Roswell	A. Hanny
Santa Fe	E. F. Sidebottom
Silver City	J. W. Carter
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DONALD STEWART DIRECTOR

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GROSS-KELLY *and* COMPANY

C. C. ROBBINS TREASURER

GEORGE ARNOT SECRETARY

W. H. ERICKSON

HEADQUARTERS — EAST LAS VEGAS N. M.

BENITO BACA

1881 1908

WE GROW WITH THE COUNTRY

W. H. BOOTH

JOHN McKAY

WHOLESALE GROCERS
DEALERS IN
WOOL, HIDES *and* PELTS

CLARENCE IDEN

H. C. SMITH

HOUSES AT

EAST LAS VEGAS, N.M., ALBUQUERQUE, N.M., TUCUMCARI, N.M.
TRINIDAD, COLO., PECOS, N.M., LOGAN, N.M.

THE FRENCH LAND AND IRRIGATION COMPANY

43,000 Acres of Irrigated Land

In Colfax County New Mexico

THERE can be no subject of more vital importance to the development of the agricultural resources of our country than the question of the conservation of the moisture in the arid and semi-arid sections of our commonwealth. That this is fully realized is exemplified, not only in the Sixteenth Irrigation Cnogress, but as well in the promulgation and construction of vast storage and distributing works both by public and private capital. The expenditures during the past ten years have reached a sum colossal in magnitude, but great as are the sums expended, the returns from such enterprises have fully justified the faith of the promotors.

Perhaps no irrigation enterprise in New Mexico today surpasses in importance that which is now under construction by THE FRENCH LAND AND IRRIGATION COMPANY in Colfax County. This Company, which was organized less than a year ago, purposes the reclamation of 43,000 acres of as rich land as can be found in the world. The waters for irrigation come from the Cimarron and Vermejo rivers and the Ponil, Cerrososo and Von Bremmer creeks. The catchment basin of these streams comprises more than a million acres of land, and with an annual rainfall in the mountains of more than twenty inches and with a very high per centage of run-off, owing to the general character of the basin, the amount of water available for irrigation, if conserved by storage, is sufficient to irrigate every available acre of irrigable land that can be reached.

The company's project provides for seven storage reservoirs with a capacity of 64,500 acre feet of water with once filling, or 129,000 acre feet with twice filling, which can easily be done. Nearly one hundred miles of main ditches are required to convey the water from the points of diversion to reservoirs and to the land.

The main thing kept in mind by the Company in planning and laying out their irrigation scheme, has been to secure construction of a permanent character. All headgate works, drops, diversion weirs, let-out tunnels, sandgates, spillways, and the riprapping on the water slopes of the dams are designed for reinforced concrete construction. The headgates are all to be of the very best steel design and modern in every way.

The soil to be irrigated is a rich, alluvial deposit and varies in depth from three to ten feet, and in color, from a dark chocolate to black, underlaid with a clay sub-soil. It is at once warm and responsive to cultivation, and at the same time being easily susceptible to irrigation and holding its moisture well. No expert who has investigated the natural advantages of this favored agricultural region has yet dared to place a limit upon its possibilities. Many home-seekers from the middle west have purchased land. Diversified and intensive farming will bring about a vast change in the agricultural methods that have hitherto obtained in this section. The cultivation of alfalfa, wheat, oats, barley, sugar beets, vegetables, apples, plums and cherries, for which this region seems especially adapted, will create a prosperous community.

The land lies with an easy slope and is a pleasing sight to the irrigation farmer. The diversity of crops made possible by the exceptionally favorable conditions of climate and soil, means small farms, intensively cultivated. The promise of an intelligent, compact community of scientific irrigation farmers on this land is certain of fulfillment. From the nature of the crops and character of people who are purchasing it for homes it requires no prophecy to predict a rural settlement upon this land not unlike those nearly ideal communities which have resulted from methods of intensive farming in Southern California.

THE FRENCH LAND AND IRRIGATION COMPANY

CAN BE REACHED BY ADDRESSING

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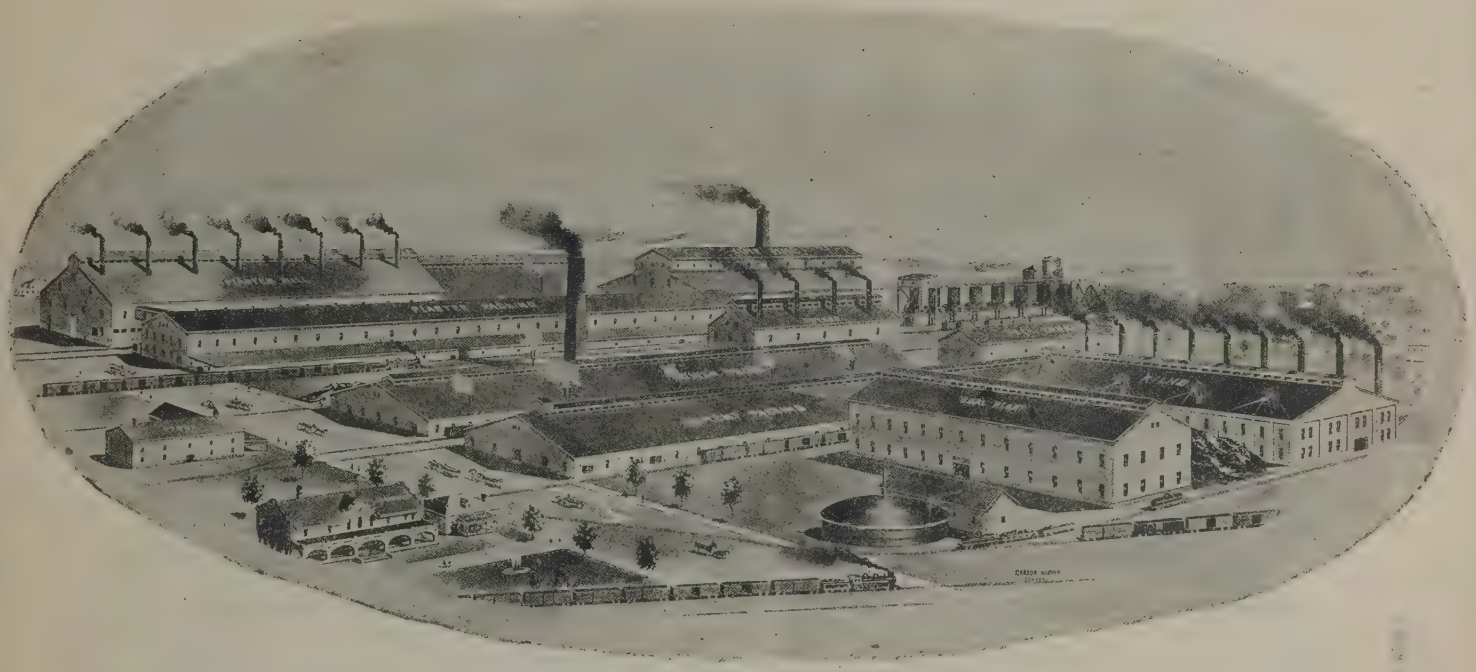

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15,000 ACRES

OF LANDS AND WATER RIGHTS ON THE ANTONIO MARTINEZ LAND GRANT

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THIS MAGNIFICENT PROPERTY IS SITUATED IN THE TAOS VALLEY, NEW MEXICO, SURROUNDED BY SNOW-CAPPED MOUNTAINS, REACHING AN ELEVATION OF 14,000 FEET. MAGNIFICENT SCENERY. AN ABUNDANT WATER SUPPLY FROM THE RIO HONDO, THE RIO SECO, THE RIO LUCERO AND THE RIO PUEBLO. THE SOIL IS A RICH RED COLOR—SANDY LOAM AND VOLCANIC ASH—VERY DEEP WITH A CLAY SUB-SOIL.

FOR FULL INFORMATION ADDRESS

The Taos Valley Land Co. (Incorporated)

A. R. MANBY, General Manager. A. F. PRESCOTT, Secretary, Taos, New Mexico.

ADDRESS ALL INQUIRIES TO THE SECRETARY

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Land under this Reservoir offers a great opportunity for investment and for homes where all kinds of grains and fruits (except tropical fruits) can be grown in abundance. A great opportunity for investors to purchase from one to ten thousand acres and subdivide. An irrigation project that will absolutely furnish water sufficient to irrigate thoroughly every acre of land sold under its system.

IN
- THE VALLEY THAT PRODUCED THE SUGAR BEETS IN 1907 HAVING THE HIGHEST TEST OF SACCHARINE IN THE U. S.
- THE COUNTY THAT TOOK THE PRIZE FOR THE BEST WHEAT AT THE WORLD'S FAIR IN 1893.
- THE RICHEST COUNTY IN NATURAL RESOURCES IN AMERICA.
- A GREAT GRAIN AND ALFALFA COUNTRY.
- A GREAT GRAIN AND FRUIT COUNTRY.
- THE BEST ALL-THE-YEAR-AROUND CLIMATE IN THE UNITED STATES.

Lands, Wholesale and Retail

WRITE TO

The Cimarron Valley Land Company

OFFICES: CIMARRON, NEW MEXICO. EAST LAS VEGAS, NEW MEXICO. ROOM 802, 135 Adams Street, CHICAGO, ILLINOIS.

Mr. Richard A. Morley, of East Las Vegas, New Mexico, who presents the above proposition to the home-seeker as well as the investor, has been in the land business for the past two years, dealing in Northern New Mexico lands, situated in the counties of San Miguel, Mora and Colfax. He is the pioneer colonizer of the now famous "Mesa Lands" situated east of Las Vegas, the development and productiveness of which lands have caused the old timer to marvel. He is President and Manager of The Meadow City Land Company, of East Las Vegas, N. M., and the reason he has made a success of this business and faith in New Mexico lands a certainty, is because of his fair dealing with all persons buying lands through him. Never over stating the conditions as to these lands, and all representations made by him being fully verified by actual investigation, have won for him an unquestioned reputation. He believes in honorable treatment and in the "Golden Rule" towards all, and stands for the highest ideals in life, which has inspired confidence in him. He has cast his lot in New Mexico, he believes in her future, her people, her wonderful resources; one of her loyal citizens he is ever ready to assist in the upbuilding of this great territory. To show his faith in this Land of Promise he has purchased and is operating two of the finest ranches in Northern New Mexico, the Rustan Ranch on the Vermejo in Colfax County, and the well known Phoenix Ranch on the Mora and Sapello Rivers in Mora County.

Mr. Morley believes that the home-seeker and actual tiller of the soil should obtain these lands at first cost, so that he can develop and improve the same, and that speculation therein should be avoided. He has placed many families on these lands, and sold thousands of acres to persons desiring safe investments.

This company takes great pleasure in stating that Mr. Morley will present his proposition before the home-seeker with limited means desiring to establish a home in the finest climate in the greatest territory in the world, upon such terms that no one can refuse to locate on the lands offered for settlement, and also to the person desiring a safe investment and sure returns, both in steady income and increase in value. He is the moving spirit of the project, which means that its success is assured. We invite you to come to the land written of by Lew Wallace, as "The Land of Sunshine," full of promise, full of resources, a great future, and succeed.

CIMARRON VALLEY LAND COMPANY.

MEAT AND BREAD AND BUTTER

San Luis Valley Wheat Field—Yield Sixty Bushels Per Acre

THE NECESSITIES of life are produced in the SAN LUIS VALLEY, Colorado, with LESS EXPENSE and LABOR, with GREATER CERTAINTY and in LARGER CROPS than anywhere else in the world.

THE SAN LUIS VALLEY is the home of the FIELD PEA, which fattens HOGS, CATTLE and LAMBS better than corn, more pounds of grain to the acre, better quality of meat, and at one-third the cost.

The FIELD PEA ENRICHES THE SOIL it grows in, and on this enriched soil are grown enormous crops of WHEAT, OATS, BARLEY and POTATOES.

PRODUCTION BEGINS AT ONCE. No waiting for trees to grow or for water to come, or to break, clear or level land. THE FIRST YEAR brings a BOUNTIFUL crop, and then MORE and MORE, every year.

EASY TERMS and the immediate certainty of returns make this the ideal proposition for the thrifty farmer of limited means. Make a start and the farm pays for itself and at the same time gives you a good living. When it is paid for, you are WEALTHY.

Besides all this, the irrigating system is old and tested, the water rights the best, the climate delightful, pure artesian drinking water, fine roads, good schools, and excellent churches at Monte Vista, Colorado, a model town and a first-class, progressive community and one of the principal towns of the Valley.

The OLDEST, LARGEST and MOST RELIABLE irrigating development and land owning companies in the Valley. We refer with pride to prosperous farmers on more than one hundred thousand acres of land in the San Luis Valley.

Monte Vista Pea Fattened Hogs Ready for Shipment to California

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JOHN MACARTHUR, Superintendent, MONTE VISTA, COLORADO

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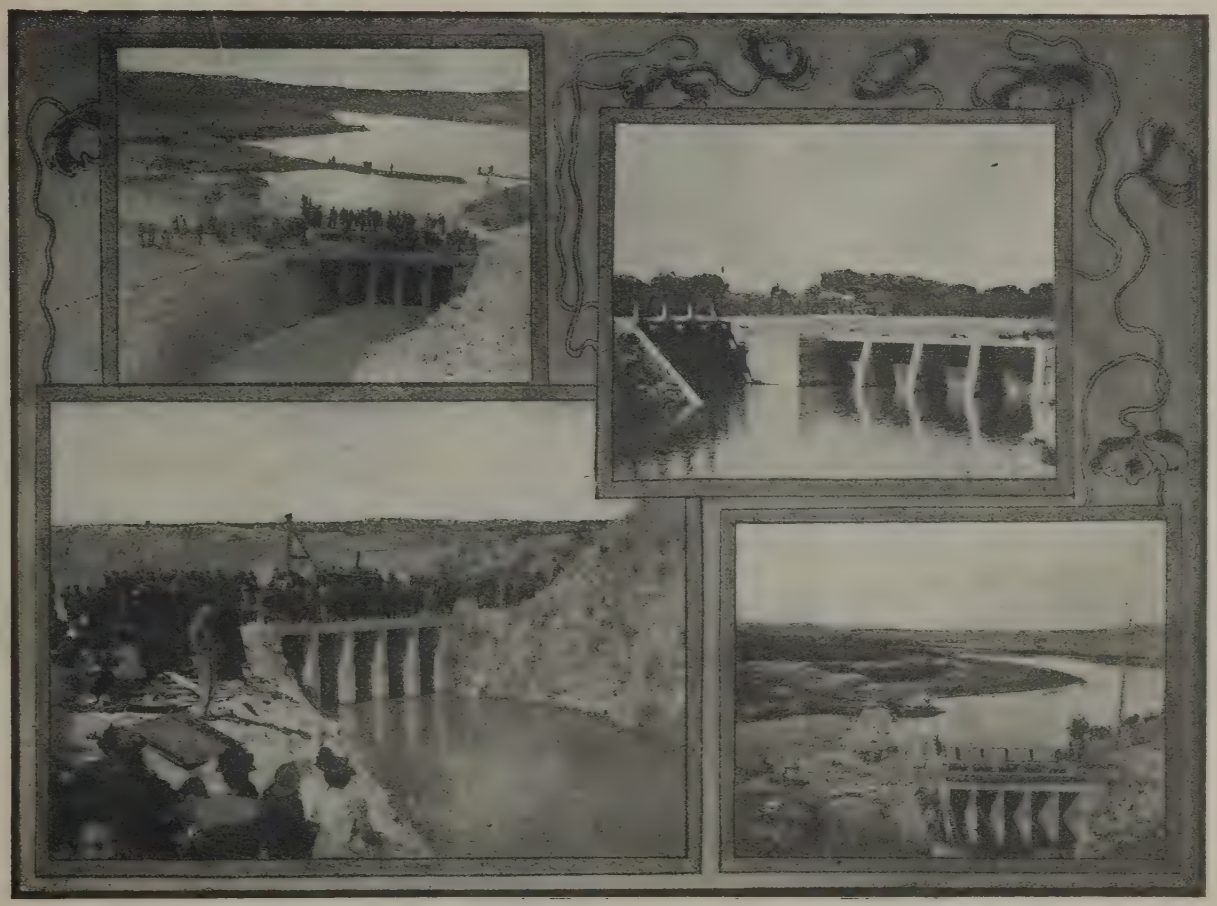
Mesilla Valley and Las Cruces

BEFORE RETURNING HOME FROM THE

Sixteenth National Irrigation Congress?

$8,000,000 Government Irrigation Project to Irrigate 110,000 Acres of Land in this Valley.



The Engle Dam is the Largest in the World, Impounding 2,000,000 Acre Feet of Water.

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YOU WILL COME AND LET US SHOW YOU

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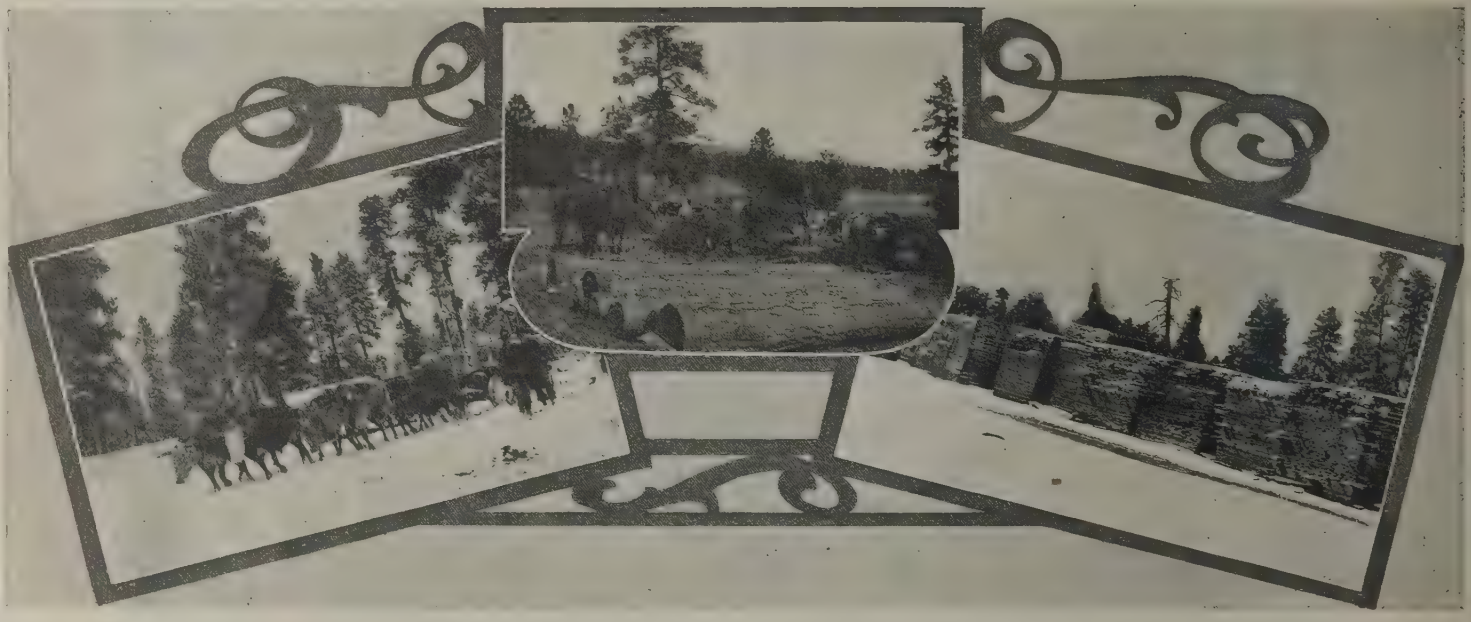

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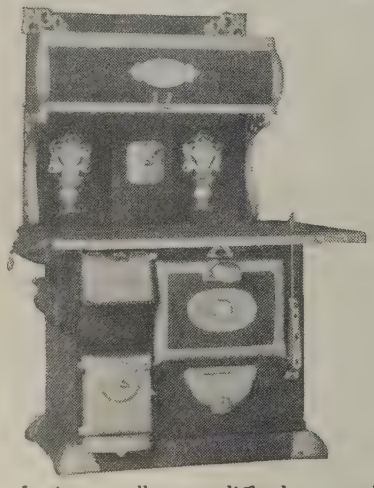

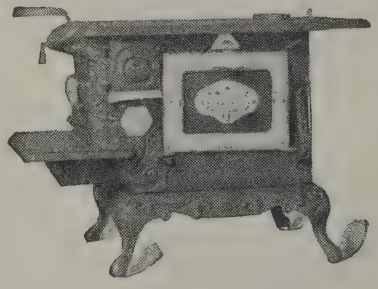

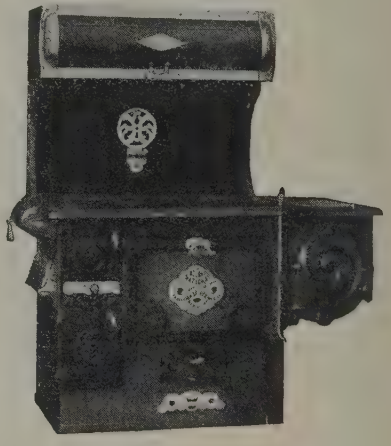

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NOR COULD YOU SELL SNOWPLOWS IN THE SOUTHWEST

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NATIONAL STOVES AND RANGES

are made expressly for the Southwest territory and are therefore the best to buy and best to use. Try them.

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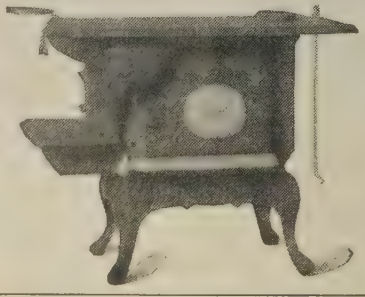

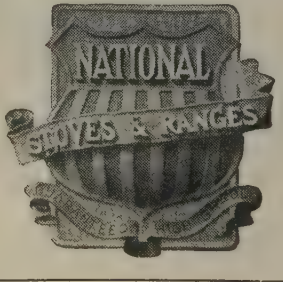

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Vegetables from Bluewater Valley Raised by Cheap Navajo Indian Labor

Main Line Santa Fe.

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High Market Prices.

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NO INTEREST NO WATER RENT
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ADDRESS

Bluewater Development Company

ALBUQUERQUE - - NEW MEXICO

Editor's Foreword

THE BOARD OF CONTROL of the Sixteenth National Irrigation Congress, recognizing that delegates and visitors to the sessions of the Congress would, as a matter of course, desire in advance, information relative to the City of Albuquerque, the great southwest and the irrigation projects, public and private, as well as all other information possible relative to the southwestern portion of the United States, authorized the compilation and publication of this book. The total expense has been borne by irrigation companies, land development companies, industrial corporations, individuals, towns, cities, districts, commercial clubs, boards of trade and farming communities in the states of Colorado and Texas and the Territories of New Mexico and Arizona.

The book presents a fair description of the Federal Irrigation projects in the southwest, the greatest government undertaking in the history of the United States. Mention is also made of other government projects in the other states under the Reclamation Act.

Delegates and visitors to previous sessions of the National Irrigation Congress have not had such an opportunity for advance information.

To the many thousands in search of homes in the Great Southwest, to those desiring to make investment, the information contained in this book is reliable and invaluable.

The thanks of the editor are due to the enterprising citizens of many communities, to engineers, eminent authors and to others for the cooperation that has resulted in this compilation.

The address of the President of the United States at the conference on the Conservation of Natural Resources, at the White House, May 13, 1908, is given in full. This masterpiece should be read by every patriotic citizen. The fact that such a conference was ever held may be directly traceable to the earnest endeavor of men who for the past decade have been identified with the National Irrigation Congress, whose labors resulted in that crystalization of public sentiment which made the Reclamation Act a possibility.

The contributions from President Roosevelt, Frederick Haynes Newell, Gifford Pinchot, C. J. Blanchard, and other prominent special writers whose names appear in the pages following, are most gratefully acknowledged.

The hundreds of beautiful halftones tell in photography what the special writers have told in clean-cut, interesting and picturesque descriptions.

Thousands of copies of this book have been distributed at great expense by the people of New Mexico and many other thousands will be ready for distribution during the sessions of the congress.

RALPH EMERSON TWITCHELL, Editor.

A MESSAGE FROM THE PRESIDENT

THE WHITE HOUSE
Washington

Oyster Bay, N. Y., June 29, 1908.

To the Irrigation Congress which is to assemble at Albuquerque in September for the sixteenth time I send greetings and congratulations upon the well deserved and widespread public interest in the meetings of this Congress, and in the cause which it represents. Irrigation, as one of the lines of conservation and development of the natural resources of the Nation, is more and more appreciated by the people of the whole country. There has been a notable change in public sentiment regarding irrigation and its place in the National economy since the beginning of your work. I attribute much of this to the discussions at your meetings.

My attention has been given especially to the irrigation of Government lands under the terms of the Reclamation Act. At the same time I appreciate the great progress which has been made through private and corporate efforts in the reclamation of our arid and semi-arid lands, and in the making of homes. Praise is due to the men who have been pioneers in this great work.

All roads to success in the creation of homes upon the arid lands should be made easy. Ultimately every possible drop of water should be conserved and every acre of land that can be irrigated should be put under the most productive system of cultivation. There is no line of effort more helpful to the public welfare than the conservation of the waste waters, bringing them out upon the waste lands, and creating small, prosperous farms owned and tilled by self-respecting, independent citizens.

I am glad to call your attention to the fact that the Reclamation Service, under the direction of Secretary Garfield and Mr. Newell, has effectively continued its work during the past year and is now taking water to 250,000 acres of land. The larger works nearing completion will soon bring water to an additional area of 1,000,000 acres. Not only has much land been irrigated, but the works built or being finished are of the most permanent nature.

The land owners who have settled on the reclaimed areas are already returning to the Treasury, in small amounts, a part of the investment of the Government. The success already attained shows that with continued good administration it will be possible to replace in the Treasury the entire investment, and to use it again in the building of other works. The gloomy predictions which were made at the outset that the cost of the works could not or would not be repaid by the people will fail. We have already advanced to a point where I think it is safe to assert that the people of the West will repay the Reclamation Fund in full, and will be able to do it out of the profits from the crops on the reclaimed land.

Mr. R. E. Twitchell, Albuquerque, N. M.

Sincerely yours,
THEODORE ROOSEVELT.

President Roosevelt's Address to the Governors

At the Opening of the Conference on the Conservation of Natural Resources, at the White House

Wednesday Morning, May 13, 1908

GOVERNORS OF THE SEVERAL STATES; AND GENTLEMEN:—

I welcome you to this conference at the White House. You have come hither at my request so that we may join together to consider the question of the conservation and use of the great fundamental sources of wealth of this Nation. So vital is this question, that for the first time in our history the chief executive officers of the States separately, and of the States forming the Nation, have met to consider it.

With the governors come men from each State chosen for their special acquaintance with the terms of the problem that is before us. Among them are experts in natural resources and representatives of national organizations concerned in the development and use of these resources; the Senators and Representatives in Congress; the Supreme Court; the Cabinet, and the Inland Waterways Commission have likewise been invited to the conference, which is therefore national in a peculiar sense.

This conference on the conservation of natural resources is in effect a meeting of the representatives of all the people of the United States called to consider the weightiest problem now before the Nation; and the occasion for the meeting lies in the fact that the natural resources of our country are in danger of exhaustion if we permit the old wasteful methods of exploiting them longer to continue.

With the rise of peoples from savagery to civilization, and with the consequent growth in the extent and variety of the needs of the average man, there comes a steadily increasing growth of the amount demanded by this average man from the actual resources of the country. Yet, rather curiously, at the same time the average man is apt to lose his realization of this dependence upon nature.

Savages and very primitive peoples generally, concern themselves only with superficial natural resources; with those which they obtain from the actual surface of the ground. As peoples become a little less primitive, their industries, although in a rude manner, are extended to resources below the surface; then, with what we call civilization and the extension of knowledge, more resources come into use, industries are multiplied, and foresight begins to become a necessary and prominent factor in life. Crops are cultivated; animals are domesticated; and metals are mastered.

Every step of the progress of mankind is marked by the discovery and use of natural resources previously unused. Without such progressive knowledge and utilization of natural resources population could not grow, nor industries multiply, nor the hidden wealth of the earth be developed for the benefit of mankind.

From the first beginnings of civilization, on the banks of the Nile and the Euphrates, the industrial progress of the world has gone on slowly, with occasional setbacks, but on the whole steadily, through tens of centuries to the present day. But of late the rapidity of the process has increased at such a rate that more space has been actually covered during the century and a quarter occupied by our national life than during the preceding six thousand years that take us back to the earliest monuments of Egypt, to the earliest cities of the Babylonian plain.

When the founders of this Nation met at Independence Hall in Philadelphia the conditions of commerce had not fundamentally changed from what they were when the Phoenician keels first furrowed the lonely waters of the Mediterranean. The differences were those of degree, not of kind, and they were not in all cases even those of degree. Mining was carried on fundamentally as it had been carried on by the Pharaohs in the countries adjacent to the Red Sea.

The wares of the merchants of Boston, of Charleston, like the wares of the merchants of Nineveh and Sidon, if they went by water, were carried by boats propelled by sails or oars; if they went by land were carried in wagons drawn by beasts of draft or in packs on the backs of beasts of burden. The ships that crossed the high seas were better than the ships that once crossed the Aegean, but they were of the same type, after all—they were wooden ships propelled by sails; and on land, the roads were not as good as the roads of the Roman Empire, while the service of the posts was probably inferior.

In Washington's time anthracite coal was known only as a useless black stone; and the great fields of bituminous coal were undiscovered. As steam was unknown, the use of coal for power production was undreamed of. Water was practically the only source of power, save the labor of men and animals; and this power was used only in the most primitive fashion. But a few small iron deposits had been found in this country, and the use of iron by our countrymen was very small. Wood was practically the only fuel, and what lumber was sawed was consumed locally, while the forests were regarded chiefly as obstructions to settlement and cultivation.

Such was the degree of progress to which civilized mankind had attained when this nation began its career. It is almost impossible for us in this day to realize how little our Revolutionary ancestors knew of the great store of natural resources whose discovery and use have been such vital factors in the growth and greatness of this Nation, and how little they required to take from this store in order to satisfy their needs.

Since then our knowledge and use of the resources of the present territory of the United States have increased a hundredfold. Indeed, the growth of this Nation by leaps and bounds makes one of the most striking and important chapters in the history of the world. Its growth has been due to the rapid development, and alas! that it should be said, to the rapid destruction, of our natural resources. Nature has supplied to us in the United States, and still supplies to us, more kinds of resources in a more lavish degree than has ever been the case at any other time or with any other people. Our position in the world has been attained by the extent and thoroughness of the control we have achieved over nature; but we are more, and not less, dependent upon what she furnishes than at any previous time of history since the days of primitive man.

Yet our fathers, though they knew so little of the resources of the country, exercised a wise forethought in reference thereto. Washington clearly saw that the perpetuity of the States could only be secured by union, and that the only feasible basis of union was an economic one; in other words, that it must be based on the development and use of their natural resources. Accordingly, he helped to outline a scheme of commercial development, and by his influence an interstate waterways commission was appointed by Virginia and Maryland.

It met where we are now meeting, in Alexandria, adjourned to Mount Vernon, and took up the consideration of interstate commerce by the only means then available, that of water. Further conferences were arranged, first at Annapolis and then at Philadelphia. It was in Philadelphia that the representatives of all the States met for what in its original conception was merely a waterways conference; but when they had closed their deliberations the outcome was the Constitution which made the States into a Nation.

The Constitution of the United States thus grew in large part out of the necessity for united action in the wise use of one of our natural resources. The wise use of all our natural resources, which are our national resources as well, is the great material question of today. I have asked you to come together now because the enormous consumption of these resources, and the threat of imminent exhaustion of some of them, due to reckless and wasteful use, once more calls for common effort, common action.

Since the days when the Constitution was adopted, steam and electricity have revolutionized the industrial world. Nowhere has the revolution been so great as in our own country. The discovery and utilization of mineral fuels and alloys have given us the lead over all other nations in the production of steel. The discovery and utilization of coal and iron have given us our railways, and have led to such industrial development as has never before been seen. The vast wealth of lumber in our forests, the riches of our soils and mines, the discovery of gold and mineral oils, combined with the efficiency of our transportation, have made the conditions of our life unparalleled in comfort and convenience.

The steadily increasing drain on these natural resources has promoted to an extraordinary degree the complexity of our industrial and social life. Moreover, this unexampled development has had a determining effect upon the character and opinions of the people. The demand for efficiency in the great task has given us vigor, effectiveness, decision, and power, and a capacity for achievement which in its own lines has never yet been matched. So great and so rapid has been our material growth that there has been a tendency to lag behind in spiritual and moral growth; but that is not the subject upon which I speak to you today.

Disregarding for the moment the question of moral purpose, it is safe to say that the prosperity of our people depends directly on the energy and intelligence with which our natural resources are used. It is equally clear that these resources are the final basis of national power and perpetuity. Finally, it is ominously evident that these resources are in the course of rapid exhaustion.

This Nation began with the belief that its landed possessions were illimitable and capable of supporting all the people who might care to make our country their home; but already the limit of unsettled land is in sight, and indeed but little land fitted for agriculture now remains unoccupied save what can be reclaimed by irrigation and drainage. We began with an unapproachable heritage of forests; more than half of the timber is gone. We began with coal fields more extensive than those of any other nation and with iron ores regarded as inexhaustible, and many experts now declare that the end of both iron and coal is in sight.

The mere increase in our consumption of coal during 1907 over 1906 exceeded the total consumption in 1876, the Centennial year. The enormous stores of mineral oil and gas are largely gone. Our natural waterways are not gone, but they have been so injured by neglect, and by the division of responsibility and utter lack of system in dealing with them, that there is less navigation on them now than there was fifty years ago. Finally, we began with soils of unexampled fertility and we have so impoverished them by injudicious use and by failing to check erosion that their crop producing power is diminishing instead of increasing. In a word, we have thoughtlessly, and to a large degree unnecessarily, diminished the resources upon which not only our prosperity but the prosperity of our children must always depend.

We have become great because of the lavish use of our resources and we have just reason to be proud of our growth. But the time has come to inquire seriously what will happen when our forests are gone, when the coal, the iron, the oil, and the gas are exhausted, when the soils shall have been further impoverished and washed into the streams, polluting the rivers, denuding the fields, and obstructing navigation. These questions do not only relate to the next century or to the next generation. It is time for us now as a Nation to exercise the same reasonable foresight in dealing with our great natural resources that would be shown by any prudent man in conserving and widely using the property which contains the assurance of well-being for himself and his children.

The natural resources I have enumerated can be divided into two sharply distinguished classes accordingly as they are or are not capable of renewal. Mines if used must necessarily be exhausted. The minerals do not and cannot renew themselves. Therefore, in dealing with coal, the oil, the gas, the iron, the metals generally, all that we can do is to try to see that they are wisely used. The exhaustion is certain to come in time.

The second class of resources consists of those which can not only be used in such manner as to leave them undiminished for our children, but can actually be improved by wise use. The soil, the forests, the waterways come in this category. In dealing with mineral resources, man is able to improve on nature only by putting the resources to a beneficial use which in the end exhausts them; but in dealing with the soil and its products man can improve on nature by compelling the resources to renew and even reconstruct themselves in such manner as to serve increasing beneficial uses—while the living waters can be controlled so as to multiply their benefits.

Neither the primitive man nor the pioneer was aware of any duty to posterity in dealing with the renewable resources. When the American settler felled the forests, he felt that there was plenty of forest left for the sons who came after him. When he exhausted

the soil of his farm he felt that his son could go West and take up another. So it was with his immediate successors. When the soil-wash from the farmer's fields choked the neighboring river he thought only of using the railway rather than boats for moving his produce and supplies.

Now all this is changed. On the average the son of the farmer of today must make his living on his father's farm. There is no difficulty in doing this if the father will exercise wisdom. No wise use of a farm exhausts its fertility. So with the forests. We are over the verge of a timber famine in this country, and it is unpardonable for the Nation or the States to permit any further cutting of our timber save in accordance with a system which will provide that the next generation shall see the timber increased instead of diminished. Moreover, we can add enormous tracts of the most valuable possible agricultural land to the national domain by irrigation in the arid and semi-arid regions and by drainage of great tracts of swamp land in the humid regions. We can enormously increase our transportation facilities by the canalization of our rivers so as to complete a great system of waterways on the Pacific, Atlantic and Gulf Coasts and in the Mississippi Valley, from the Great Plains to the Alleghenies and from the northern lakes to the mouth of the mighty Father of Waters. But all these various uses of our natural resources are so closely connected that they should be coordinated, and should be treated as part of one coherent plan and not in haphazard and piecemeal fashion.

It is largely because of this that I appointed the Waterways Commission last year and that I have sought to perpetuate its work. I wish to take this opportunity to express in heartiest fashion my acknowledgement to all the members of the Commission. At great personal sacrifice of time and effort they have rendered a service to the public for which we can not be too grateful. Especial credit is due to the initiative, the energy, the devotion to duty and the far-sightedness of Gifford Pinchot, to whom we owe so much of the progress we have already made in handling this matter of the co-ordination and conservation of natural resources. If it had not been for him this convention would nor could have been called.

We are coming to recognize as never before the right of the Nation to guard its own future in the essential matter of natural resources. In the past we have admitted the right of the individual to injure the future of the Republic for his own present profit. The time has come for a change. As a people we have the right and the duty, second to none other but the right and duty of obeying the moral law, of requiring and doing justice, to protect ourselves and our children against the wasteful development of our natural resources, whether that waste is caused by the actual destruction of such resources or by making them impossible of development hereafter.

Any right thinking father earnestly desires and strives to leave his son both an untarnished name and a reasonable equipment for the struggle of life. So this Nation as a whole should earnestly desire and strive to leave to the next generation the national honor unstained and the national resources unexhausted. There are signs that both the Nation and the States are waking to a realization of this great truth. On March 10, 1908, the supreme court of Maine rendered an exceedingly important judicial decision. This opinion was rendered in response to questions as to the right of the legislature to restrict the cutting of trees on private land for the prevention of droughts and floods, the preservation of the natural water supply and the prevention of the erosion of such lands, and the consequent filling up of rivers, ponds and lakes. The forests and water power of Maine constitute the larger part of her wealth and form the basis of her industrial life, and the question submitted by the Maine senate to the supreme court and the answer of the supreme court alike bear testimony to the wisdom of the people of Maine, and clearly define a policy of conservation of natural resources, the adoption of which is of vital importance not merely to Maine, but to the whole country.

Such a policy will preserve soil, forests, water power as a heritage for the children and the children's children of the men and women of this generation; for any enactment that provides for the wise utilization of the forests, whether in public or private ownership, and for the conservation of the water resources of the country, must necessarily be legislation that will promote both private and public welfare; for flood prevention, water power development, preservation of soil and improvement of navigable rivers are all promoted by such a policy of forest conservation.

The opinion of the Maine supreme court sets forth unequivocally the principle that the property rights of the individual are subordinate to the rights of the community, and especially that the waste of wild timber land derived originally from the State, involving as it would the impoverishment of the State and its people and thereby defeating one great purpose of government, may properly be prevented by State restrictions.

The Court says that there are two reasons why the right of the public to control and limit the use of private property is peculiarly applicable to property in land; "First, such property is not the result of productive labor, but is derived solely from the State itself, the original owner; second, the amount of land being incapable of increase, if the owners of large tracts can waste them at will without state restriction, the State and its people may be helplessly impoverished and one great purpose of government defeated. * * *.

"We do not think the proposed legislation would operate to 'take' private property within the inhibition of the Constitution. While it might restrict the owner of wild and uncultivated lands in his use of them, might delay his taking some of the product, might delay his anticipated profits and even thereby might cause him some loss of profit, it would nevertheless leave him his lands, their product and increase untouched, and without diminution of title, estate, or quantity. He would still have large measure of control and large opportunity to realize values. He might suffer delay, but not deprivation. * * *. The proposed legislation * * * would be within the legislative power and would not operate as a taking of private property for which compensation must be made".

The court of errors and appeals of New Jersey has adopted a similar view, which has recently been sustained by the Supreme Court of the United States. In delivering the opinion of the Court on April 6, 1908, Mr. Justice Holmes said: "The State as quasi-sovereign and representative of the interests of the public has a standing in court to protect the atmosphere, the water, and the forests within its territory irrespective of the assent or dissent of the private owners of the land most immediately concerned. * * * It appears to us that few public interests are more obvious, indisputable and independent of particular theory than the interest of the public of a State to maintain the rivers that are wholly within it substantially undiminished, except by such drafts upon them as the guardian of the public welfare may permit for the purpose of turning them to a more perfect use. This public interest is omnipresent wherever there is a State, and grows more pressing as population grows. * * * We are of the opinion, further, that the constitutional power of the State to insist that its natural advantages shall remain unimpaired by its citizens is not dependent upon any nice estimate of the extent of present use or speculation as to future needs. The legal conception of the necessary is apt to be confined to somewhat rudimentary wants, and there are benefits from a great river that might escape a lawyer's view. But the State is not required to submit to an aesthetic analysis. Any analysis may be inadequate. It finds itself in possession of what all admit to be a great public good, and what it has it may keep and give no one a reason for its will."

These decisions reach the root of the ideal of conservation of our resources in the interests of our people.

Finally, let us remember that the conservation of our natural resources, though the gravest problem of today, is yet but part of another and greater problem to which this Nation is not yet awake, but to which it will awake in time, and with which it must hereafter grapple if it is to live, the problem of national efficiency, the patriotic duty of insuring the safety and continuance of the Nation. When the people of the United States consciously undertake to raise themselves as citizens, and the Nation and the States in their several spheres to the highest pitch of excellence in private, State and national life, and to do this it is the first of all the duties of true patriotism, then and not 'till then the future of this Nation, in quality and in time, will be assured.

The Reclamation Service During 1908

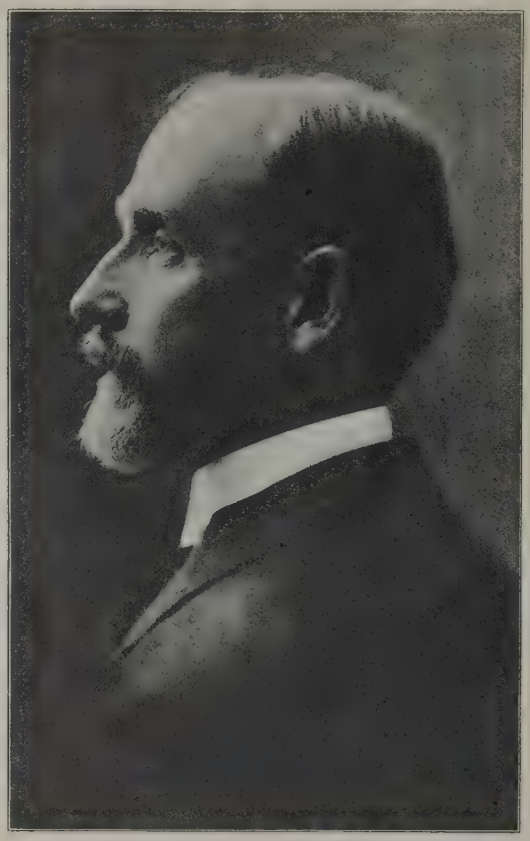
By FREDERICK HAYNES NEWELL, Director United States Reclamation Service.

IN PRESENTING to the Sixteenth National Irrigation Congress the results of the work of the Reclamation Service for the past year, the most important fact to record is that there is now a large area of land under irrigation, which is being cultivated in small farms by settlers who are returning to the Treasury the cost of operating and maintaining the works and who are beginning to make the first of the ten annual instalments which will refund to the Treasury the cost of bringing water to the land. The complete circle of operations contemplated by the Reclamation Act is now in full swing.

There remain still to be solved many questions of detail, especially of operation and management and of dealings with large communities. These are being handled by creating water users' associations and putting them on a basis such that they may maintain the works successfully when the Secretary of the Interior is able to relinquish control.

A resume of the principal works is as follows:

ARIZONA, SALT RIVER PROJECT. This project involves the construction of a storage dam 284 feet in height at Roosevelt, Arizona, which will impound 1,284,000 acre-feet of water, and which will create a reservoir having a superficial area of 16,300 acres, or 25.5 square miles. This structure will probably be completed in 1910 and will regulate the supply of water in Salt River. Forty miles below the dam the water is diverted by means of a low dam into the main canals, one on each side of the river, covering 160,000 acres of land in the vicinity of Phoenix and Mesa.



A power canal 18.5 miles long, having a capacity of 220 second-feet, has been constructed and is now being used to develop 4,400 horse power, which is utilized by all the accessory plants incidental to the work of construction. When the great Roosevelt dam is completed several thousand horse power will be developed and utilized to pump water from underground sources to supplement the surface supply and increase the irrigable area. A cement mill erected and operated by the Government is furnishing the cement used in the construction work. The dam alone will require 240,000 barrels.

CALIFORNIA, YUMA PROJECT. This project contemplates the diversion of the waters of Colorado River by means of the Laguna dam, about ten miles northeast of Yuma, Arizona, into two canals, one on each side of the river. These canals will irrigate all the bottom lands of Colorado and Gila Rivers in Arizona between Laguna dam and the Mexican boundary (84,000 acres in round numbers), and in California the bottom lands in the Yuma Indian Reservation (17,000 acres), all tributary to the Southern Pacific Railroad. A complete system of levees to protect the bottom lands from overflow is being constructed, and a pumping system will be utilized to remove the surplus water from the low-lying areas.

Work on the Laguna dam and sluiceways is progressing rapidly, and the Yuma dikes are nearly completed. It is expected that water will be furnished to about 10,000 acres in 1908 by means of a pumping plant and the old gravity canal.

CALIFORNIA, ORLAND PROJECT. This project involves the reclamation of 12,000 acres of land, lying about 90 miles north of Sacramento in Glenn and Tehama counties. The lands are exceedingly fertile, and for many years have been cultivated and utilized for wheat growing. With irrigation and the prevailing climatic conditions, however, it has been demonstrated that the land is unequalled for the production of alfalfa, nuts, and both citrus and deciduous fruits. Preliminary work on this project is practically completed and advertisement for bids for building the East Park dam and spillway will be made in the near future.

COLORADO, UNCOMPAHGRE VALLEY PROJECT. This project provides for the diversion of waters of Gunnison River by means of a tunnel 30,580 feet in length, cross section 10½ by 11½ feet, cement lined, capacity 1,300 second-feet. The tunnel passes through a range of mountains and carries the water to Uncompahgre Valley, where it will be utilized for the reclamation of 150,000 acres of land in Montrose and Delta counties. Construction on the tunnel was begun in 1904, and nearly five miles have been excavated.

COLORADO, GRAND RIVER PROJECT. This project is planned to irrigate about 60,000 acres of land in Grand Valley, in the extreme western part of the state. The work involves the construction of a diversion dam in Grand River, 52 miles of canal, and a series of short tunnels on the first few miles of the canal.

IDAHO, MINIDOKA PROJECT. This project provides for the reclamation of about 130,000 acres of land lying on both sides of Snake River, in Southern Idaho. The area benefited was all Government land. Three town sites were established, and the farm unit was fixed at 40 acres within a radius of 1½ miles from the center of each town site, and 80 acres on other lands.

By means of co-operative work with the settlers the canals on the south side are being rapidly pushed forward, and water will be furnished for the season of 1909. Plans are now under consideration for the installation of a pumping plant to furnish water for these lands.

IDAHO, PAYETTE-BOISE PROJECT. The Payette-Boise project will reclaim land in the fertile valleys of the Payette, Boise and Snake Rivers, in Southwestern Idaho. Construction work is well under way, and many settlers have already taken up their homesteads.

KANSAS, GARDEN CITY PROJECT. This project consists of a pumping system designed for the recovery of underground waters, which are delivered to an old canal known as the Farmers' Ditch. The plant consists of twenty-three separate pumping stations, each driven electrically from a central power station. About 10,000 acres of land lying east of Deerfield and north of Garden City, Kansas, will be irrigated.

MONTANA, HUNTLEY PROJECT. This project will reclaim about 30,000 acres of land located along the Yellowstone River, in Southeastern Montana. As these lands are a part of the ceded strip of the Crow Indian reservation, settlers will be required to pay $4 per acre to the Indians, one dollar at the time of entry, and seventy-five cents annually for four years. In addition to this, the Government will charge the settler the cost of building the irrigation works, $30 per acre, payable $3 per acre per annum, for ten years; the payments may be made in five years if desired. The first payment of $4.60 per acre will become due when the land is filed upon.

MONTANA, SUN RIVER PROJECT. The lands under this project are located west of the center of Montana, on the eastern slope of the Rocky Mountains, and near Great Falls. The Sun River Valley

is about 70 miles long, from one to five miles wide, and a large part of it is already in cultivation. The ultimate development of this project involves the reclamation of 256,000 acres of land. A compact body of 17,000 acres, or 250 farms, known as the Fort Shaw unit, is now ready for settlement under the homestead law.

Montana, Milk River Project. This project contemplates the ultimate reclamation of land in Milk River Valley, between Chinook and Glasgow, Montana. A great deal of attention has been attracted to this project by reason of the international character of the streams to be diverted. In addition to regulating the discharge of Milk River, the water supply will be supplemented from the St. Mary Lakes. It is proposed to store the discharge of the St. Mary drainage basin and conduct the water by canal to the headwaters of Milk River.

Nebraska-Wyoming, North Platte Project. This project is located about 100 miles north of Cheyenne, Wyoming, and extends along North Platte for nearly 500 miles. Forty thousand acres will be supplied with water in 1908, almost all of which has been already filed upon.

Nevada, Truckee-Carson Project. The first unit of this project, consists of a low, 600-foot concrete diversion dam, with two years ago, has all been filed upon. The second unit is now being settled, and contains 1,000 80-acre farms. In addition to the small filing fee, each settler is required to pay $3 per acre annually, for ten years, without interest on deferred payments.

New Mexico-Texas, Rio Grande Project. This project involves the construction of a storage dam 265 feet high, opposite Engle, New Mexico, across the Rio Grande, which will form a reservoir 200 feet deep at its lower end and 45 miles long, with a storage capacity of over 2,000,000 acre-feet. The water thus stored will be used for the irrigation of 180,000 acres of land in New Mexico, Texas and Mexico.

The Leasburg Diversion, which is a part of the Rio Grande project, consists of a low, 600-foot concrete diversions dam, with pier, embankment and sluice gates, head weir and head gates. In connection with the diversion dam six miles of full-sized canal were constructed to connect with the old Las Cruces Canal. Construction on this work was begun in November, 1906, and water was furnished during March, 1908. About 20,000 acres will be irrigated this season.

New Mexico, Carlsbad Project. The principal works under the Carlsbad project include the reconstruction of canals and storage reservoirs on Pecos River, in Eddy county, which were built by private enterprise, to irrigate about 20,000 acres of land.

New Mexico, Hondo Project. The Hondo project provides for diversion and storage of the flood waters from Hondo River, a tributary of the Pecos, to irrigate 10,000 acres of land in the vicinity of Roswell.

North Dakota-Montana, Lower Yellowstone Project. This project provides for the diversion of the Yellowstone River at a point 18 miles northeast of Glendive, Montana, for the irrigation of 66,000 acres of land. Water may be available for 45,000 acres in 1909. Two-thirds of this area is in Montana, the balance in North Dakota. Surrounding the project is one of the largest and best grazing areas in the United States, providing a fine free range for vast numbers of cattle and sheep.

North Dakota, Pumping Projects. The Government has three pumping projects in Western North Dakota for the purpose of raising water from the Missouri River to irrigate bench lands which cannot be reached by feasible gravity systems. Steam and electric power will be used for pumping, the power to be developed from lignite coal, which is found in ample quantities on Government lands adjacent to the projects. Two of these systems, the Williston and the Buford-Trenton, are practically completed.

Oregon-California, Klamath Project. The Klamath project contemplates the reclamation of about 190,000 acres of land situated in Klamath county, Oregon, and Modoc and Siskiyou counties, California. The plans involve in addition to the irrigation of the valley lands, the reclamation by drainage and future irrigation of a portion of the Lower Klamath and Tule Lakes, lands which are now either swamp or lake bottoms.

Construction work on the first nine miles of the main canal and the laterals thereunder was begun in March, 1906, and completed in 1907. From this water will be delivered to from 12,000 to 15,000 acres during the irrigation season of 1908.

Oregon, Umatilla Project. The Umatilla project is located 190 miles east of Portland, Oregon, and contains 20,000 acres of land bordering upon the Columbia River, immediately east of Umatilla River. Water is now available for about 7,000 acres of this land. The farm unit under this project varies from 10 to 20 acres. The total building charge is $60 per acre, and until further notice the maintenance charge will be $1 per acre per annum.

South Dakota, Belle Fourche Project. When completed

this project will reclaim about 100,000 acres of land lying north and northeast of the Black Hills in Butte and Meade counties, South Dakota. About half of this is Government land, a large part of which has been filed on. Water is now available for about 12,000 acres.

Utah, Strawberry Valley Project. This project provides for the irrigation of about 40,000 acres of land in central Utah, situated from 5 to 15 miles south of Provo and on the eastern shore of Utah Lake. The water supply will be received from a storage reservoir to be built on Strawberry River, about 30 miles east of the irrigable area. By means of a tunnel four miles long stored waters will be carried through the mountains and emptied into Spanish Fork, from which a canal from 18 to 20 miles long will convey them to the irrigable area.

Washington, Okanogan Project. This project is designed to supply water to 8,650 acres of land in Okanogan Valley, in Northern Washington. The land is very fertile, and owing to the exceptionally favorable climate a wide variety of products, many of which are high-priced, are produced.

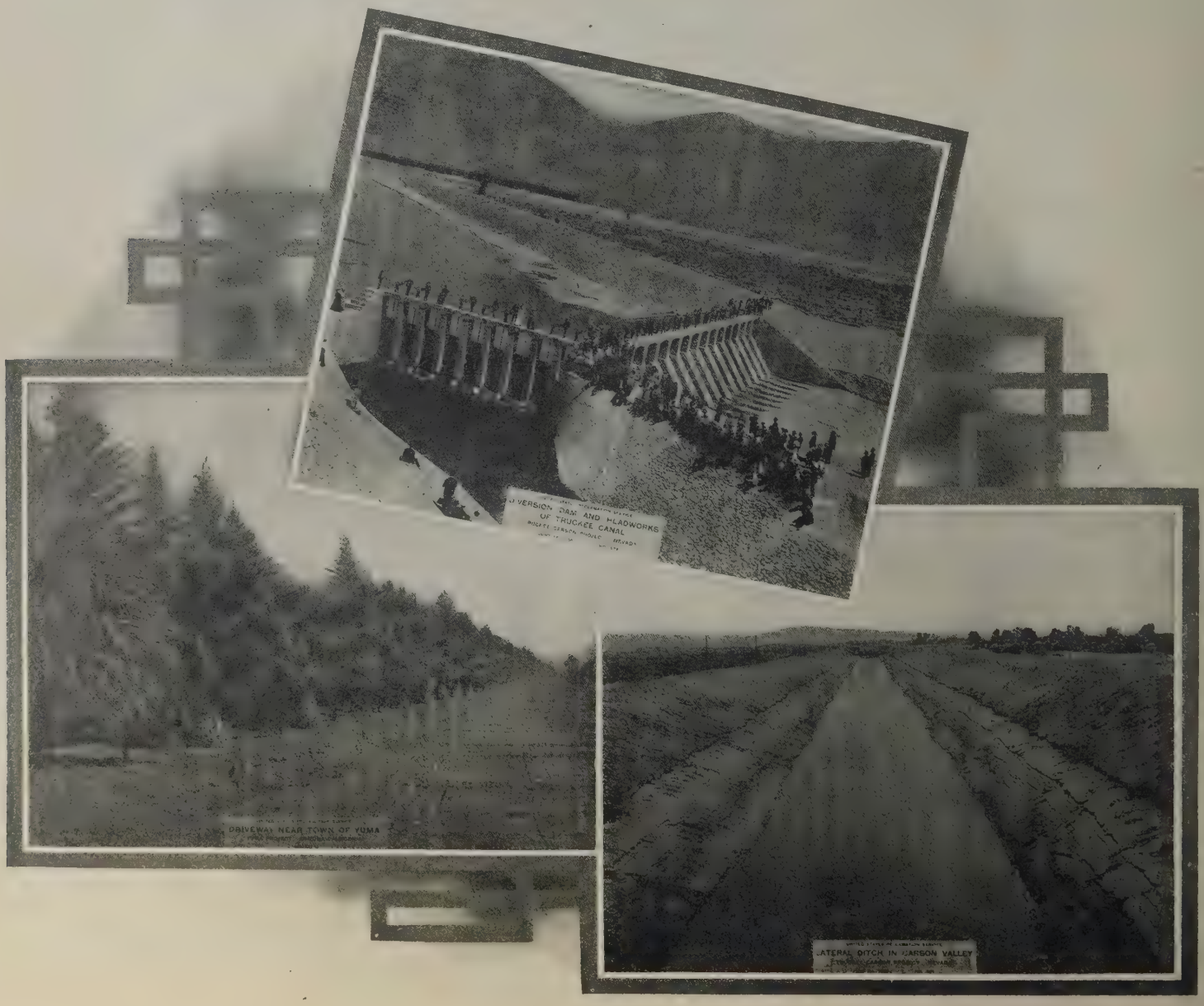
Washington, Yakima Valley Projects. On the eastern side of the Cascades, in Washington, are a succession of valleys in the drainage of the Yakima River. It is estimated that with storage the water supply is sufficient for nearly half a million acres of land. Storage is being provided by erecting dams at the outlets of several mountain lakes, the capacity of which total 840,000 acre-feet. The development of a comprehensive system of irrigation in Yakima Valley will be accomplished by the successive construction of several units of a general project, the work being gradually extended to embrace the entire irrigable area. The project has been divided into the following units, each involving the reclamation of a specified acreage:

Tieton Project. The land under this unit lies near the city of North Yakima. The engineering features are difficult and expensive. For twelve miles the main canal must be excavated along the steep sides of the Tieton Canyon, and more than two miles of tunnel are being excavated.

Sunnyside Project. Work on this project consists of the enlargement and extension of an existing system known as the Sunnyside Canal System, which was purchased by the Government. The work is now going forward rapidly. When completed the system will supply water to 46,000 acres of land now desert in addition to the 40,000 acres at present irrigated by the old canal.

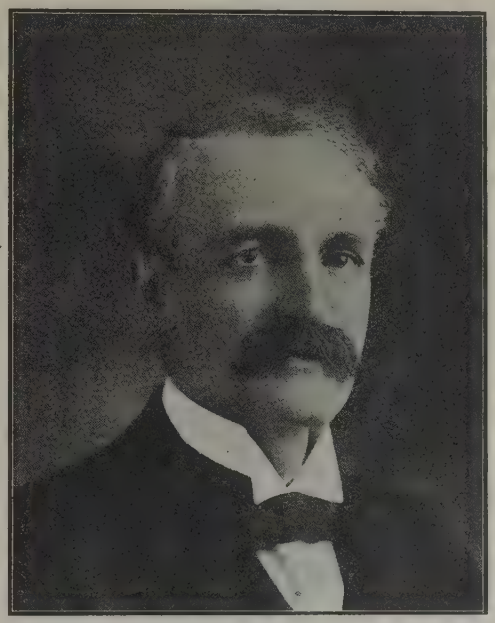
The Wapato Project. The irrigable lands under this project are all embraced in the Yakima Indian Reservation. There are some 120,000 acres susceptible of irrigation, some 17,000 acres of which are now receiving water during high-water periods.

Wyoming, Shoshone Project. This project involves the diversion of a portion of the waters of Shoshone River and the construction of an impounding dam at the head of the canyon through which the river flows. The reservoir thus created will have a storage capacity of 456,000 acre-feet. When the project is completed it will be possible to reclaim about 150,000 acres of irrigable public land. Thirteen thousand acres lying about 75 miles east of the Yellowstone National Park will receive water this year.



Water Conservation and Forestry

By GIFFORD PINCHOT



THE VALUE of water is only beginning to be realized by the American people. In the older parts of the country water has generally been thought of very much as we think of the air—a necessity of life supplied by nature in abundance for all, about which we do not need to concern ourselves. In the West irrigation has taught a different view. The man who has water can turn the desert to fertility; but there is not enough water to go around. Yet the full meaning of the water problem has not been generally perceived.

In reality, it is in some ways the most important material problem of our immediate future. Our national destiny, as well as the average welfare of our people, is involved in its solution. Water is our most valuable fundamental resource; but it must be taken care of and used with intelligence and forethought, or it will lose most of its value. Even where it is most in demand, it is the problem of its distribution, not of its conservation, which has been chiefly to the fore. But it is the problem of the conservation and best use of water that most needs the attention of the public.

In 1800 we were a nation of five million people; in 1850, of 23 millions; in 1900, of 75 millions. By 1950 we shall doubtless number at least 150 millions. That will call for twice as much food as was consumed in 1900. Twice as much food means better cultivation or a larger area cultivated. But over much of the country the average yield per acre of our farms is decreasing. Most of the good natural farm land has been taken up. If our children are not to go hungry, we must either grow more on our present farms or make new farms by reclaiming the desert and the swamp. As a matter of fact, we must do both. But at the best, reclamation can supply but a small part of the increasing needs of the coming generation.

How much of the declining fertility of our farms is due to soil exhaustion, and how much is the result of leaching and soil-wash, we do not yet know. But we do know that our rivers run to the seas rich with the best of our soil. The water which runs off from the fields is all the time robbing them of their value. This loss of farm fertility is no theory. It is a tax greater than the levy of the tax collector; but since the farmer pays it, not as he does his taxes, out of his earnings, but out of the capital value of the farm itself, it is less felt, though more dangerous. Only the farmer who puts back into the soil enough to make good the loss pays the bill out of his earnings instead of letting it run in the form of depreciation.

Land conservation and water conservation go together. Water both wears out and wears down the land. Water conservation and forest conservation are twins. Water is the best of servants, the worst of masters. Conserve the forest and you keep water the servant. Destroy the forest, and you leave water the master; and this is truest in the mountains.

In mountainous regions, forests form the most effective means of controlling and equalizing stream flow possessed by man. All our great river systems head in mountain ranges, and the main source of supply of irrigation waters comes likewise, in surface or underground streams, from the mountains. Full development both of the use of land through irrigation and of the use of water as a source of industrial power and a means of transportation depends first of all on how we treat our mountain forests.

Artificial reservoirs to store water equalize stream-flow and provide water both for irrigation and for power, but their permanent value depends on their being filled with water, not with mud. If the forests are cut or burned away from mountain slopes, the streams at once become turbid. The more the land gullies the faster the water runs off and the greater its eroding power becomes. Forests are themselves reservoirs. They soak up the water as it falls, holding it in the soil which they build up and feeding it out slowly. Occasionally this effect is denied on the strength of personal observations in single instances. Such observations are almost invariably mistaken. The general fact is undeniably established both by prolonged scientific tests and by the vast bulk of common experience and common sense. When the trees are gone the reliability of the water supply goes with them.

The extent of the damage done varies in different localities. In this country the need of a protective forest cover is least in the humid climates and districts of glacial geology of the northeast and northwest. Glacial soils are usually very deep, and do not erode easily. The greater part of the rain, therefore, sinks into the earth. In the mountainous parts of the southeast and southwest the need of forests to protect the soil is greatest. Though the amount of rainfall in these regions varies from heavy to very light, it comes in downpours of considerable volume, which result in severe erosion if the water is not controlled. In the East the removal of forests, largely through clearing for agriculture of land which should never have been farmed, has seriously affected navigable rivers. The James, the Roanoke, the Neuse, the Cape Fear, the Pedee, the Savannah, Chattahoochie, and Tennessee, the Upper Ohio with its tributaries, and many other streams of this region are seriously impaired by the low autumnal run-off largely due to reduced forests. On many of these streams autumn navigation has become impossible. In addition, sand and silt bars have been formed in practically every river in the East. These bars are made up of material washed from steep slopes which are losing, in consequence of erosion, all their power of usefulness. Kept in forest, such slopes would have had perpetual earning power. In the West the effect of deforestation and forest fires is too well known to need comment.

The protective power of the forest is greatest at the sources of rivers and on the steeper slopes. Yet the forest can also be a valuable defense against the erosive action of the current along streams in the lowlands. The trees bind the banks with their roots, check the force of the current when the flood overflows, and may cause a deposition of fertile sediment where otherwise the top soil already in place might be swept away. All these effects were illustrated in the Kay Valley floods in 1903.

In the southwest, especially in California, the channels of many of the streams flowing through semi-arid plains have been badly changed by silting up. In the Sacramento and San Joaquin rivers, even the channels at the mouth have silted up in places. In this way the value of the rivers as waterways have been seriously impaired. Though this was primarily the result of hydraulic mining, the destruction of forest humus by fire in the mountains and excessive grazing have done much harm.

In the northwest and southwest, however, most of the drainage basins of the headwaters of the larger rivers are now in National Forests, which are being managed to preserve and regulate the flow of streams. Gradually, as the protection from fire which is now afforded to them permits the accumulation of humus and in other ways improves the surface, and as the thousands of acres of land denuded by fire and reckless cutting are brought back to forest by natural or artificial means, their efficiency as stream regulators and protectors of the soil will increase many fold. This will improve the rivers and help irrigation, which is the great hope of the West. The fate of our streams is closely tied up with the fate of our forests. Every improvement in the condition of our forests is bound to benefit the rivers. Harm to the forests will be followed, as surely as night follows day, by harm to the rivers. The old truth that there *can be no successful water management without forest management,* which is an accepted axiom in the older countries, must be also fully recognized here, and must be built into the very foundation of all our plans for a wiser use of our water and land resources.

Home-Making by the Government

By C. J. BLANCHARD, Statistician, U. S. Reclamation Service.

WE HAVE come upon a time in our national life when the question of providing homes for our people bulks larger than ever before. The time is not far distant when it will become acute. The rapid narrowing of the limits of our unoccupied public domain and the tremendous increase in land values in all the settled sections of the United States render it yearly more difficult for the man of small means to get a foothold on the land. There is congestion today in many of our cities, and the menace of a great population underfed and poorly housed looms more darkly each year. So great is the land hunger that already a quarter million families, comprising some of the best blood of the nation, have expatriated themselves and taken up new homes under a foreign flag. What is the use of preaching love of home and country when we offer nothing but crowded tenements to the toiler who seeks to earn a roof over his family? Our nation's greatness has its foundation in the home of the man whose feet are firmly planted upon his own land. There is no national stability in a citizenship born and reared in tenements. Patriotism, loyalty and civic pride are not bred and fostered in the crowded centers of population. The destiny of the nation is foreshadowed in the provisions made for the prosperity and contentment of its citizens. An assurance that the great mass of our people shall reside in homes of their own is an assurance that our future will be one of stability and progress.

The home-making instinct is a well developed trait in American character. Our forefathers who landed on the bleak and inhospitable shores of New England, their descendants, the pioneers who conquered the Middle West, and the Argonauts of this generation who crossed the trackless plains were impelled by this instinct more than by the love of adventure or the lure of gold to wander forth into strange lands.

From the very inception of our Republic our legislators have recognized that it was a national duty to render the acquirement of homes as easy as possible. This recognition was shown in liberal grants to the defenders of the country in Revolutionary times, and later in the beneficent homestead law which opened to settlement the Mississippi Valley. It has been recognized since by the enactment of other statutes making easy the acquirement of the public domain. Areas greater in extent than many of the original states have been donated for the purpose of making habitable the unutilized lands of the people. At one time the property of the nation embraced 1,800,000,000 acres; today it has been reduced to less than 500,000,000 acres. Much of it was squandered by the government, it is true, but out of that public domain twenty vigorous commonwealths have arisen, and an agricultural empire has come into being that is today the marvel of the world.

The remaining public lands occupy two distinct agricultural regions, differing materially in climate, soil and crops. West of the Missouri River lies a vast region extending westward to the foothills of the Rocky Mountains and from the Panhandle of Texas northward into Canada. It is known as the Great Plains. For many years the vast region has been utilized as a public

common. Countless cattle and sheep have had free access to it and overgrazed it. Its administration is still one of the most vexing problems before Congress. The pioneer of the Great Plains was the cattleman. He farmed but little, and from the nature of his business and the methods of operation, as a rule, wanted no neighbors.

The real home-builder, who undertook to subdue the plains to agriculture, encountered many difficulties. In many sections there was no timber and he was forced to build his house of sod or adobe. He found the streams were not dependable; they were dry in summer, when water was most needed. Nature, however, provided an inexhaustible supply of underground water, which the farmer pumped into small reservoirs and then led to his garden and orchard and supplied his livestock. He harnessed the wind, which blows almost constantly on the prairies, and made it a cheap and useful servant for his work.

Within the past 15 years there has been an awakening to the opportunity which lies in the Plains area, and settlements have moved westward with such remarkable rapidity that the day of the broad, free range, with the old, careless and often inhuman methods of stockraising, is about over. The day of smaller flocks and herds, winter fed and fattened on home-grown forage, is at hand.

In the Great Plains area the Reclamation Service has in progress of construction 11 projects involving an expenditure of $18,740,000 and the reclamation of 500,000 acres. Several of these projects are unique, and in their engineering features are deserving of extended description. All have reached a stage of construction where water will be available this season, and the hundreds of new homes which dot the prairies show that the settlers are preparing to put it to use.

PROJECTS IN NORTH DAKOTA

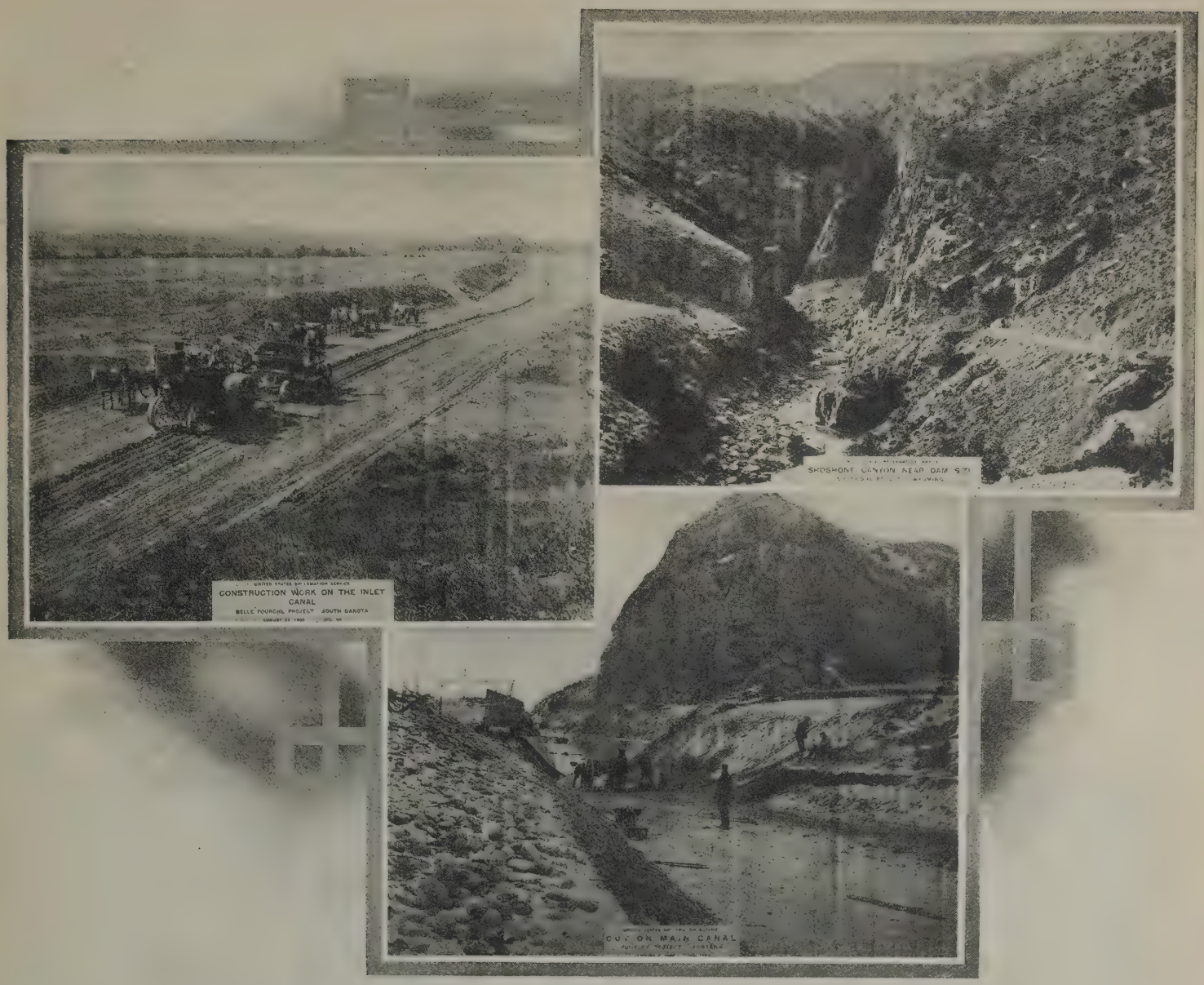
Three of these projects are located in North Dakota, in the valley of the Missouri River, and in the vicinity of the town of Williston. The Missouri River at this point is a whimsical stream, habitually cutting its banks and changing its channel, so that the engineers find it impracticable to locate any permanent structure for the diversion of water by gravity.

Fortunately great beds of lignite were discovered in the vicinity on public land, and the engineers proposed that the government should turn coal miner, mining its own coal and developing power therefrom. A large power house was erected at the mine and power is now conveyed electrically to the river. An exceedingly unique plan was devised to overcome the eccentricities of the Missouri. The pumps are placed on floating barges, which will accommodate themselves to changes in the river channel and in the water level. The water is delivered through pipes with flexible joints into reservoirs, and from these basins is pumped into canals. These reservoirs serve to settle the silt, large quantities of which are carried in solution by the Missouri River. The central plant, near Williston, supplies power to two of these projects.

A heavy influx of settlers is anticipated this year to take up the lands to be irrigated. Diversified and intensive farming by irrigation will bring about a great change in the agricultural methods now in vogue in this section. The cultivation of alfalfa, sugar beets, vegetables and such fruits as apples, cherries, grapes, melons and berries of all kinds, for which this region is adapted, will doubtless create a prosperous community in a few years. This project is on the Great Northern Railway.

LOWER YELLOWSTONE PROJECT

Not far from here, in the Lower Yellowstone Valley, and embracing 66,000 acres of land in Montana and North Dakota, is the Lower Yellowstone project. The settlement of this large area has been progressing rapidly, and aside from a few thousand acres of railroad lands, which will be sold this year, about all of the land is filed upon. The works include a timber-covered, rock-filled dam 700 feet long, headworks of concrete,


CONSTRUCTION WORK ON THE INLET CANAL
BELLE FOURCHE PROJECT SOUTH DAKOTA
SHOSHONE CANYON NEAR DAM SITE
CUT ON MAIN CANAL

and a huge canal 67 miles long and several hundred miles of laterals and small ditches.

HUNTLEY PROJECT

Up the Yellowstone about 200 miles is the Huntley Project, which was completed in June, 1907. It is located 12 miles east of Billings, Montana, and embraces 30,000 acres of land, having a general elevation of 3,000 feet above sea level. The irrigable area has been divided into 589 farms of 40 acres each, and more than half of these have already been filed upon. The project offers unusual advantages for the practical farmer of small means to secure a good home, whereon by his own industry he can secure a comfortable living. The climate here is delightful and the soil of exceptional fertility, producing bountiful crops when watered. Cereals and alfalfa are the principal crops, although apples, small fruits and garden vegetables do well. On account of the fine range country surrounding the project, alfalfa will always be a staple product. It produces about five tons to the acre at present, and is worth $5.00 a ton in the stack. A sugar beet factory is now in operation at Billings and the farmers are increasing their acreage in this crop, as it is very profitable. Unusual facilities for transporting crops to the large markets are afforded by two lines of transcontinental railroads, the Northern Pacific and the Chicago, Burlington & Quincy, which traverse this tract. No farm is more than three miles from a shipping point. There are eight new towns on this project at intervals of about 5 miles along the two lines of railroad, and town lots are now offered for sale by the government at reasonable prices.

SUN RIVER PROJECT, MONTANA

Not far from the thriving city of Great Falls, Montana, the first unit of the Sun River project was opened to settlers on May 7th. This project, when completed, will be one of the largest undertaken by the government, irrigating nearly 256,000 acres, or considerably more than the cultivated acreage of Rhode Island. An interesting feature in connection with this project is the proposition of the engineers to augment the water supply by taking water from the streams now flowing into the Pacific Ocean through a gap in the continental divide to a water-shed which drains into the Atlantic Ocean. The Sun River Valley proper is about 70 miles long and from one to five miles wide. The unit opened in May is the abandoned Fort Shaw Military Reservation, which contains about 200 80-acre farms.

On this project the rural settlement plan of the Reclamation Service will be carried out, and there will be a village about every six miles. The solid is a warm sandy loam covered with buffalo grass, gramma and wheat grass. All the crops which can be grown in the northern countries can be raised in this section. The principal crops will be largely alfalfa, sugar beets and potatoes.

MILK RIVER PROJECT, MONTANA

In northern Montana the Milk River project, by reason of the international character of the streams to be diverted, has attracted a great deal of attention. The irrigable area in the valley of Milk River is greater than the water supply and the engineers propose to store water now flowing into Hudson Bay to augment the insufficient flow of Milk River, a tributary of the Missouri. Nearly 250,000 acres are involved in this project. The valley has a soil of sandy loam well adapted to raising all the products of the north temperate zone. The construction of the necessary dams and

canals will require several years. Milk River Valley is tributary to the Great Northern Railroad.

SHOSHONE PROJECT, WYOMING

On the northern border of Wyoming, in a region of exceeding rough country, the government is building the highest masonry dam in the world. This structure, which will rise 310 feet above its foundation, blocks a very narrow gorge. It will be 108 feet thick on the bottom and only 175 feet long on top. We might get a better conception of the enormous height of this dam if we compared it with the height of some familiar building. Take, for instance, the Flat Iron building in New York. Placed side by side, the Shoshone dam would rise one story higher.

The work here is difficult and dangerous. Workmen are lowered into the canyon, the walls of which are hundreds of feet high, and, with ropes about their bodies as they work, put in the drill holes for blasting. Before work could be begun on this structure it was necessary for the Reclamation Service to build a road 8 miles in length to get into the canyon. This road was cut for the most of the distance from the solid walls of rock. The dam will create behind it the largest lake in the State of Wyoming with a superficial area of 10 square miles and an average depth of 70 feet.

Twelve miles below the Shoshone dam a diversion dam is being built in the river which will turn the stream into a tunnel 3 1-4 miles in length, connected at the other end by a large canal which carries the water out upon 100,000 acres of choice land.

A portion of this area will be watered next spring, and is opened to settlement at this time to bona fide citizens of the United States. The irrigable lands are reached by the Chicago, Burlington & Quincy Railway.

NORTH PLATTE PROJECT

In southern Wyoming another large work is well under way. The structure known as the Pathfinder Dam is being erected in a narrow canyon of the North Platte River at the identical point where General John C. Fremont, the noted explorer, nearly lost his life while attempting to get through in a boat. This structure will be 215 feet high and will create an enormous reservoir with a storage capacity of 1,025,000 acre feet, or enough water to cover 1,025,000 acres a foot deep. To better appreciate the quantity of water in this reservoir it should be understood that it is sufficiently capacious to hold back the greatest flood ever known in this turbulent stream. In connection with this dam and reservoir the government has built a large canal 95 miles in length to carry the waters on to lands in Wyoming and Nebraska. Owing to the rough country along the canal route, several large concrete viaducts were constructed and for several miles the canal is lined with cement. The irrigable lands are tributary to the Chicago & Northwestern, Chicago, Burlington & Quincy and the Union Pacific Railway systems.

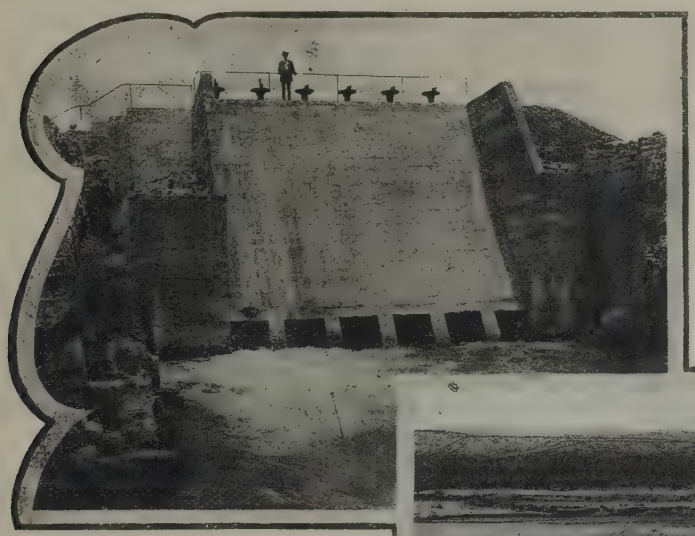
BELLE FOURCHE PROJECT, SOUTH DAKOTA

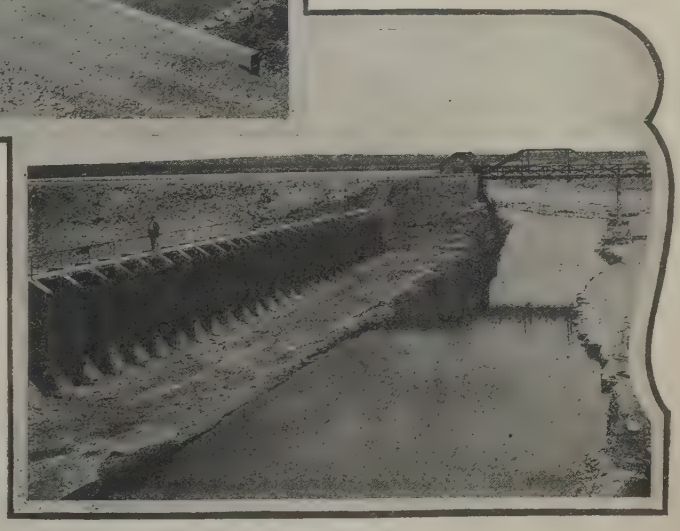
Northeast of the Black Hills, in South Dakota, lies the beautiful valley of the Belle Fourche, embracing several hundred thousand acres of exceedingly fertile land. In this valley the Reclamation Service has completed a great work for the irrigation of 100,000 acres.

By means of a concrete diversion dam the entire flow of the Belle Fourche River will be diverted into an inlet canal 6 1-2 miles in length and large enough to carry the minimum flow of the Potomac River at Point of Rocks. This canal turns the water into a natural depression between two hills. This depression is blocked by one of the largest earthen embankments in the world, a structure more than a mile in length and 115 feet

in maximum height. The reservoir thus formed has a storage capacity of 203,770 acre feet, and forms the largest lake in the State of South Dakota.

Home seekers have been pouring into this valley for the last two years, and nearly all of the public land is now occupied by settlers who are awaiting the completion of the works. The towns in the valleys have more than doubled in population since the work began. There are opportunities for home seekers to secure land from private owners whose buildings are in excess of the requirements of the Reclamation Act. The principal markets for the products of this valley are the mining towns in the Black Hills, the Twin Cities, also Omaha and Chicago, which are reached by the Chicago & Northwestern, and Chicago, Burlington & Quincy railways. Back of the irrigated country is a vast area of public lands which is available for ranging cattle and sheep. The principal products will be alfalfa, cereals, vegetables and the hardy fruits.





CARLSBAD PROJECT
1. Lower Face of Main Headgate.
2. Dam and Headworks.
3. Main Headgate, Showing Spillway.

GARDEN CITY PROJECT, KANSAS

In southwestern Kansas the Garden City project, although embracing only 8,000 acres, is relatively one of the important government works in the Plains region. Owing to the numerous novel features involved in its construction, the project has attracted much attention. It is believed that the successful initiation of this system will encourage private capital to take up work in other parts of the Arkansas Valley and elsewhere on the Great Plains.

As the Arkansas River could not be depended upon to supply water to gravity canals, the engineers devised a scheme to utilize the underflow. About 300 wells were sunk, the combined length of which exceeds 4 miles. These wells are in groups of 12 each and vary from 12 to 15 inches in diameter. Each group will be operated by its own pumping plant and all pumps will be operated by electricity generated in a central power station. The water from the wells will be lifted into a concrete lined conduit, which discharges into the main canal. During the irrigation season this leviathan pumping plant will lift 30,000 acre feet, or about 11,000,000,000 gallons.

The value of land in this part of Kansas, in its natural condition, varies from $5 to $15 per acre. When reclaimed by irrigation it is easily worth from $100 to $150 per acre. The principal crops are sugar beets and alfalfa, considerable quantities of which are already under cultivation. Apples and melons are especially profitable crops when irrigated. This section is tributary to the Santa Fe Railway System.

NEW MEXICO PROJECTS

There are three national projects in the Territory of New Mexico, two of which, the Carlsbad and Hondo, are practically completed and will water 30,000 acres this season.

The Hondo project provides for diversion and storage of the flood waters from Hondo River, a tributary of the Pecos and will reclaim 10,000 acres of land in the vicinity of Roswell. No public land is watered by this project, but lands in private ownership are for sale at reasonable prices.

The Carlsbad project is located on the Pecos River, in southeastern New Mexico, on the Santa Fe System. The entire acreage is in private ownership, but several thousand acres are included in excess holdings and must be disposed of to farmers who will purchase water-rights under the government system. The price of land varies from $20 to $60 per acre.

The climate is mild. In winter the temperature during the day is seldom below freezing. The summer temperature seldom goes above 100 degrees and the nights are always pleasant.

The soil is a light, sandy alluvium and very fertile. The chief crops in the valley are peaches, pears, apples, cherries, small fruits, alfalfa, cotton, sweet potatoes, celery and garden truck. Five crops of alfalfa are grown each year, yielding a total of 5 to 8 tons per acre. Fruits, cotton and alfalfa are the most profitable crops and fodder corn, cane and milo maize yield good forage crops. Stock raising is profitable, owing to extensive range lands to the east and west.

There is a good market for horses and mules at Carlsbad, and hay is always in demand here and at other points in the valley. Cotton, after being ginned, is shipped to Houston or Galveston. Kansas City, Wichita, El Paso, Fort Worth, etc., afford markets for all other excess supplies. The Pecos Valley is a good winter feeding center for range stock.

Cotton gins, cotton seed oil and oil cake factories, and canneries for the manufacture of denatured alcohol are needed in the valley. There are at present water power plants at Carlsbad and at a point five miles below, and there is room for additional plants further down stream.

The Rio Grande Project involves the construction of a large storage dam 255 feet high, opposite Engle, New Mexico, across the Rio Grande, which will form a reservoir 175 feet deep at its lower end and 40 miles long with a storage capacity of 2,000,000 acre-feet, for the irrigation of 180,000 acres of land in New Mexico, Texas and Mexico.

The Leasburg Diversion, which is a part of the Rio Grande Project, consistd of a low, 600 foot concrete diversion dam, with pier, embankment and sluice gates, head-weir and head-gates. In connection with the diver-

ALFALFA FIELD IN RIO GRANDE VALLEY
RIO GRANDE PROJECT NEW MEXICO
IRRIGATING ALFALFA FIELD
RIO GRANDE VALLEY
RIO GRANDE PROJECT NEW MEXICO

sion dam 6 miles of full-sized canals were constructed to connect with the old Las Cruces canal. Construction was begun November 27, 1906, and water is supplied to 10,000 acres this summer. The valley has splendid railroad facilities and contains many thriving cities and towns, of which El Paso, Texas, is the metropolis.

OUR INLAND EMPIRE

Beyond the Rocky Mountains lies the true desert, a land of mysterious silence, a land of potential greatness, awaiting the magic kiss of canal-borne water to wake to teeming fecundity. It is often called the inland empire.

In many parts of it Nature has placed in juxtaposition all the natural elements except rainfall required for a fruitful, prosperous country. Its climate is healthful and salubrious; its valleys and plains possess a soil of inexhaustible fertility, and from the forest-clad mountains, with summits in regions of perpetual snow, countless streams rush downward to both oceans or flow into desert sinks and there evaporate. How to overcome the absence of moisture from the clouds and thus bring the region to its proper state of development is today a problem of paramount importance. Its successful solution will provide a safety valve against the impending dangers of congestion in the cities of the East.

The future of our desert empire is, in a measure, predicated by the marvelous achievements of the pioneers. With a courage born of conviction and fostered by the hope which dwells perennial in the breast of the Argonaut of the sagebrush country, they have, within the past few years, wrested from a region long regarded as absolutely worthless a crop-producing, home-supporting area of inexhaustible fertility, greater in extent than the cultivated lands in Massachusetts, Connecticut, Delaware, New Hampshire, New Jersey, Rhode Island and Vermont, and capable of supporting a larger rural population. More than $120,000,000 have been expended in irrigation works in the West, and 70,000 miles of canals now carry the life-giving waters to 10,000,000 acres, which each year produce crops valued at more than $250,000,000.

As good American citizens, we owe it to ourselves to extend our knowledge of this splendid country. There is an inspiration in the breadth and vastness of this sleeping empire in the West, and a sublimity in the lofty mountains whose summits are clothed in perpetual snow. One breathes optimism and grows in mental breadth and strength in contemplating scenery which has no counterpart in the world.

The economic value of national irrigation cannot be measured in dollars and cents. The desert made habitable offers the boon of health to him who erects his dwelling upon it. You cannot fix the possibilities of this land of silence and sunshine. We know that the influence of its far-flung horizons and its true perspective are potential in character molding and building. Instead of the dead level of mediocrity, which prevails in modern city life, the desert offers the uplift of unmeasured distances, the perpetual sunshine, and the individual home, with the broader freedom of action which comes with life in the open. There is a constant inspiration to industry, a stimulation to endeavor, in the superabundant life which springs from the bosom of the desert when water is applied. The transformation which follows irrigation is so remarkable that we are prone to believe Aladdin and his lamp have really appeared.

MINIDOKA PROJECT, IDAHO

Three years ago last July I camped for the night on the banks of the Snake River, in southern Idaho. Save for our campfire there was no sign of human habitation within 30 miles, only a vast sage-brush plain, rimmed on every side by the horizon.

It was a night to remember. Over us spread a star-gemmed canopy; around us the embers of a sage-brush fire shed their glow. In the near distance the doleful wailing of the skulking coyote sent a chilly feeling up and down the spine.

A weather-tanned engineer in faded Khaki sitting beside me drew rough plans in the sand, and I listened, interested, but doubting, while he pictured the future of the dusty plain. That engineer's plan found

favor in Washington, and in two months actual work of construction began. An army of men came upon the field and starightway took that river and blocked it with a wonderful dam; then they led it into 130 miles of great canals and 190 miles of ditches and spread it over 85,000 acres of land.

Attracted by the signs of industry, settlers poured in and every 40 or 80 acres of that vast area was taken up. Houses began to dot the plain and a railroad 100 miles long, a branch of the Oregon Short Line, was built through the center of the tract. Three new towns sprang up as if by magic. On the site of our camp a schoolhouse stands which opened last year with 74 pupils. Today 1,400 families are living on farms and a thousand people are living in towns where a trifle over three years ago the eye met nothing but dust and desolation.

The Minidoka project furnishes indubitable evidence that a better investment was never made by a government since the world began than national irrigation. President Roosevelt said, "No part of this nation can be benefitted without a reflex benefit to the other part." In this one project we find the proof of this statement, for the 1,400 families who are at work in that desert valley in Idaho today are furnishing a market for endless quantities of manufactured articles, the bulk of which are eastern made.

PAYETTE-BOISE PROJECT, IDAHO

The Payette-Boise Project will reclaim 372,000 acres of land in the fertile valley of the Payette, Boise and Snake Rivers in southwestern Idaho, which are tributary to the Oregon Short Line, the Boise, Nampa & Owyhee, and the Idaho Northern railroads. The lands are in Ada, Canyon and Owyhee counties and are generally smooth, with gentle slopes. Construction work is well under way and many settlers have already taken up their homesteads.

The valleys are the best populated in the state. The citizens came largely from the Middle West and are prosperous and progressive. With superior market and transportation facilities, with soil and climate adapted to diversified and intensive farming, this section is destined to become one of the most densely populated agricultural regions in the Northwest.

UNCOMPAGHRE PROJECT, COLORADO

In southwestern Colorado the most spectacular project of the government is nearing completion. In this region two streams, the Uncompaghre and the Gunnison, flow in nearly parallel courses about 10 miles apart and separated by a mountain range 2,000 feet high. The Uncompaghre flows through a broad valley containing several hundred thousand acres of fertile land. Its volume is sufficient for the irrigation of only a small part of the irrigable area. On the other hand, the Gunnison River, a stream of much larger discharge, flows in a profound canyon and in its valley there is no considerable area of land to be watered. To augment the insufficient flow of the first stream the greatest underground waterway in the world is being constructed—a tunnel 6 miles long, with a cross section 10 1-2 by 12 feet, under a mountain 2,000 feet. It will bring to the valley a part of the waters of the Gunnison River. The history of this project is replete with danger, daring and heroism and the men who initiated this work and those who have carried it forward furnish proof enough that all of Uncle Sam's heroes do not wear uniforms.

The topographers who followed to complete the original survey encountered almost unheard of trials. Many times it was necessary to lower them by ropes hundreds of feet into the canyon. The location for the tunnel was determined at a point where the canyon was more than half a mile deep. It was necessary then to construct a road into this frightful gorge, a remarkable road, 16 miles long with grades out of the canyon 23 per cent in places. Heavy machinery was brought in and a power plant installed.

The difficulties encountered have tried the heart of those engaged upon the work. Gas, cave-ins and subterranean springs have all interposed obstacles requiring the utmost care in the prosecution of the work. At frequent intervals heavy flows of water have been encountered. This has required the installation of complete pumping facilities. At the present time pumps are discharging about 250,000 gallons per 24-hour day and the quantity pumped has been as high as 750,000 gallons during the same period. More than four miles of the tunnel have been excavated up to date. While the tunnel work was going on many miles of canals were dug, some of which were in exceedingly unfavorable country and necessitated cement lining.

Irrigation from this project will begin in 1909 and 140,000 acres of land, much of which is adapted to the growing of deciduous fruits, will be ready for settlement. The Denver & Rio Grande Railway traverses this section.

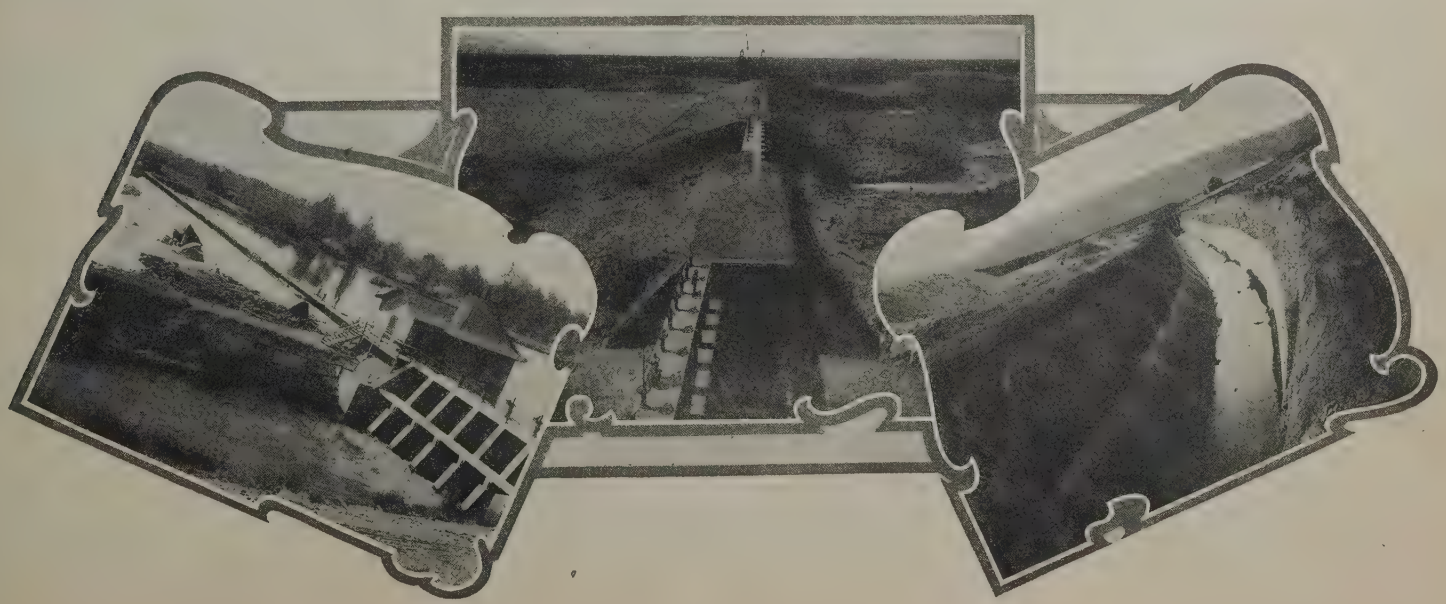
STRAWBERRY VALLEY PROJECT, UTAH

This project provides for the irrigation of about 60,000 acres of land in central Utah, situate from 5 to 15 miles south of Provo, and on the eastern shore of Utah Lake. Water supply will be received from a storage reservoir to be built on Strawberry River, about thirty miles east of the irrigable area. By means of a tunnel 3 1-2 miles long stored waters will be carried under the divide and emptied into Spanish Fork, from which a canal from 18 to 20 miles long will convey them to the irrigable area. The lands have a mean elevation of 4,500 feet.

YAKIMA VALLEY PROJECTS, WASHINGTON

On the eastern side of the Cascades, in Washington, are a succession of valleys in the drainage of the Yakima River. Comprehensive plans have been worked out by the Reclamation Service and construction is well under way for the reclaamtion of the largest project yet undertaken. The irrigable area is nearly a half-million acres and the cost will probably exceed $15,000,000. The work is being taken up in divisions, each involving the irrigation of specified areas.

Storage is provided by erecting dams at the outlets of several mountain lakes, the capacity of which will total 804,000 acre feet. On the Sunnyside Unit the govern-



ment purchased a large canal, enlarged it and rebuilt the diversion dam in the Yakima. Last year this system supplied 40,000 acres and a crop census showed that the yields amounted to $2,000,000 or $50 per acre.

No section of the United States gives more generous returns for the labor employed than the Yakima Valley. I have never dared to tell Easterners what I really know to be true about the crop yields. Some of the views will give you an idea of the intensive farming practiced there.

Among the wealth producers the apple orchards take a high rank. Full-bearing orchards produce frequently from $300 to $1,200 per acre annually. It can be stated that $300 is less than the average for all well-kept orchards. The fruit grown here is attractive, sound and ships well. Its market is New York and Europe and the commission men are so eager for the crop that it is often contracted for in advance. Orchard lands sell for from $300 to $2,000 per acre, depending upon location and condition of trees. The pear crop is very profitable and peaches and grapes do well. A large area is in hops and the yields here are so generous that I am told Yakima is driving New York out of the hop-growing business.

The Yakima Indians find employment in the hop fields during the picking season and usually camp just outside the fields. Alfalfa is another money-maker, producing from 6 to 8 tons per acre worth on an average of $5 per ton in the stack. In 1907 the Yakima Valley shipped fruit to the value of $1,125,000. Its hay crop was worth $2,000,000; potatoes, $250,000; onions, $50,000, and hops, $200,000, a total of farm products of $3,625,000. Sixty-five thousand cattle and 20,000 sheep were ranged and fed in this valley in 1907, valued at about $2,000,000.

Ten and 20-acre farms are common in this valley, and this has brought about compact rural settlements along the irrigation canals. In turn there has followed a gradual improvement in social conditions with the elimination of the isolation of farm life, which has in itself proven such an important factor in swinging the pendulum of population from the farm to the town. The luxuries of town life are enjoyed in a measure by the farmer who at the same time lives a life of freedom in the open.

When the works on this section are completed the Yakima Valley will become one of the show places of the country. Over a greater portion of the irrigable area the farms will not exceed 20 acres in area and we may look for a population of 250,000 in this favored region in the not far distant future. Fully developed the taxable property should have a value of not less than $70,000,000, making it one of the richest agricultural districts in the world.

The area which can be reclaimed is nearly double that which is now irrigated in southern California. A splendid part of the life in the Yakima Valley is that one can live out of doors so much of the year. The same share of clear skies and dry air that makes southern California so attractive is enjoyed in Washington. The valley is on the main line of the Northern Pacific and the new line of the Chicago, Milwaukee & St. Paul Railway, now building.

OKANOGAN PROJECT, WASHINGTON

The Okanogan country lies about half in British Columbia and half in the United States. Owing to its remarkable climate this valley has been called the California of the Northwest. The Reclamation Service has nearly completed an interesting engineering work here to reclaim 8,000 acres. The land is very fertile and, owing to the exceptionally favorable climate, a wide variety of products, many of which are high priced, are produced. Frost has never injured the fruit in the valley in which this work is located and there has never been a failure with apples, pears, cherries, nectarines, grapes and all the varieties of small berries grown in the United States. The nearest railway town is Wenatchee, on the Great Northern, from which place steamboats ply daily up the Columbia to Brewster, and thence by stage 28 miles to Okanogan, a town of 400 inhabitants.

UMTILLA PROJECT, OREGON

The Umatilla project in northeastern Oregon, when compared in area with many others now under construction, might be regarded as one of the lesser works, but when studied as to its possible future development it easily takes a prominent place among the most favorable and attractive agricultural regions in the West.

No expert who has investigated this wonderful land of sunshine has yet dared to place a limit upon its agricultural possibilities. Nature here gives the maximum return for the minimum of labor.

The irrigable lands lie in rolling benches along the Columbia and between it and the Umatilla . The diversity of crops, many of which are high priced, made possible by the exceptionally favorable conditions of soil and climate, predicate small farms intensely cultivated, providing homes for an intelligent and prosperous husbandry. The promise of a compact community of scientific agriculturists in this valley is certain of fulfillment in the near future. From the nature of the crops and the character of the people who will grow them it requires no particular gift of prophecy to predict the establishment in this valley of a rural settlement which will be likened unto many of those nearly ideal communities which have grown up under methods of intensive irrigation in southern California.

The water supply is the flood flow of the Umatilla, which is stored in a reservoir created by constructing an earthen embankment nearly 100 feet in height and one-half mile long. Owing to the exceedingly porous character of the soil, many of the canals are lined with cement.

The line of the Oregon Railroad and Navigation Company passes through the irrigated area.

TRUCKEE-CARSON PROJECT, NEVADA

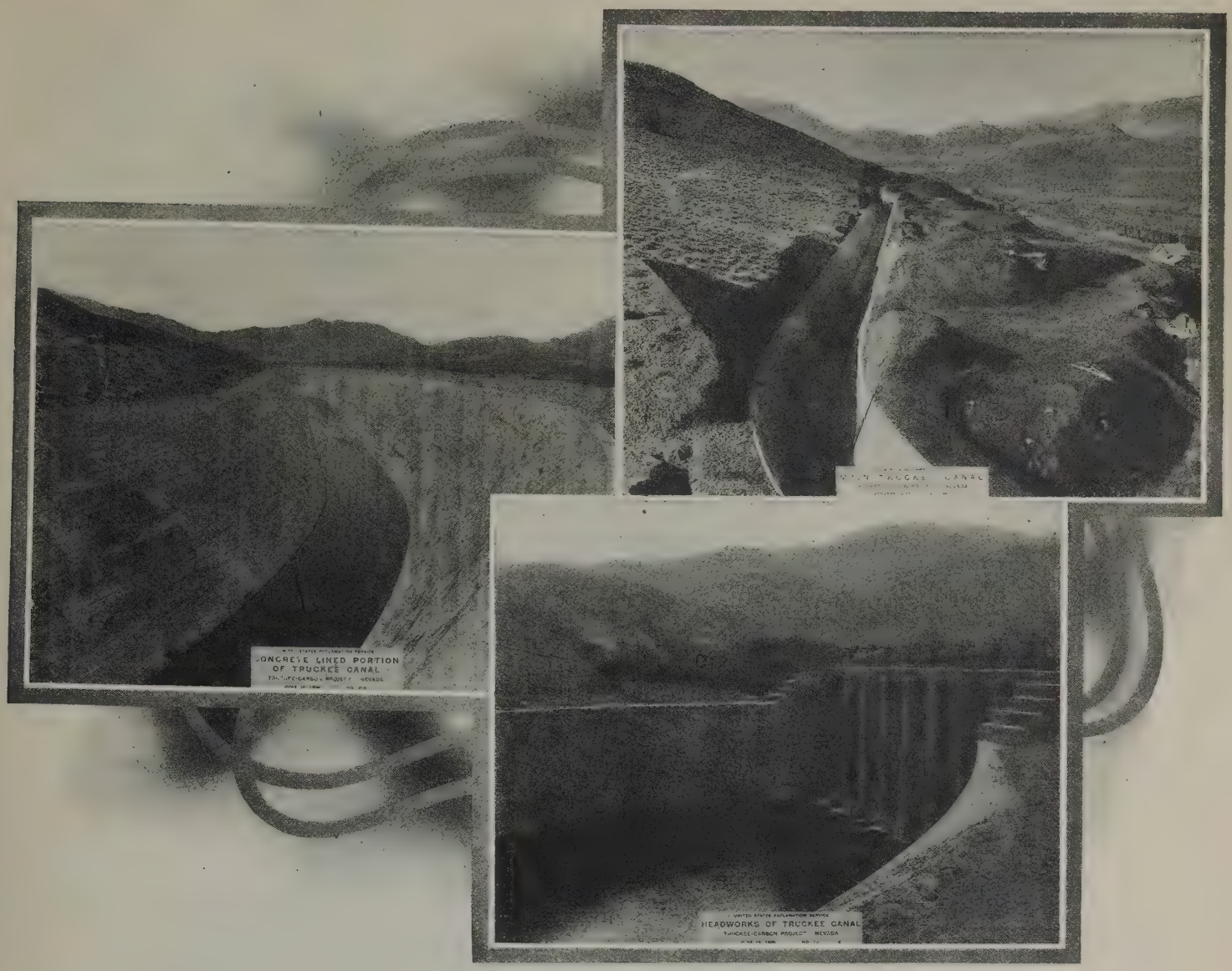
On the western border of the Great Interior Basin in the bed of ancient Lake Lahontan, in Nevada, an important work is now completed to irrigate 160,000 acres. This is the dryest part of the United States except Death Valley, and was called "Forty Mile Desert" by the gold hunters who crossed it enroute to California. The old overland trail can still be traced across the desert and we come upon many melancholy evidences of desert tragedies, enacted in the early fifties. In excavating canals our great shovels have encountered the bones of men and horses who perished of thirst. We know now that much of their suffering was unnecessary. There is plenty of good water not far below the surface of the sands. In fact, the grave diggers, if they had gone a few feet deeper, would have been able to satisfy their own thirst. The irrigation works in this valley in a way have changed physical geography. The Truckee River is lifted from its bed by a huge dam 30 feet high, which turns the water into a broad and deep canal 31 miles long and lined with cement. Truckee River is now flowing into Carson River. Another dam in Carson River diverts the combined flow of both streams upon the desert which has already begun to blossom. Eight hundred farms are now awaiting settlers here. The terms are easy and the market for farm products is the best in the West. You reach this valley on the Southern Pacific Railway.

KLAMATH PROJECT, OREGON-CALIFORNIA

The Klamath Project contemplates the reclamation of about 190,000 acres of land situated in Klamath County, Oregon, and Modoc and Siskiyou Counties, California. The plans involve, in addition to the irrigation of the valley lands, the reclamation by drainage and future irrigation of a portion of the Lower Klamath and Tule Lakes, lands which are now either swamp or lake bottoms. Practically all the uplands, which include the greater part of the project, are held in private ownership, mostly in large holdings, which, under the terms of the Reclamation Act, must be subdivided into tracts of not to exceed 160 acres.

The public lands under the project, which include nearly all the lake and swamp areas, are at present withdrawn from entry. When these lakes are restored to entry, homesteaders may file applications for available public lands.

Construction work on the first 9 miles of the main canal in and the laterals thereunder was begun in March, 1906, and completed in 1907. From this canal water will be delivered to from 12,000 to 15,000 acres during the irrigation season of 1908. The lands under the project are of good quality. The principal crops grown are alfalfa, wheat, oats, barley, rye, vegetables and some deciduous fruits. A few experiments in sugar beet culture show that it is probable that this crop can be successfully grown. The principal town of the valley is Klamath Falls, located on Link River,



about one mile below the lower end of Upper Klamath Lake. Other towns in the valley are Merrill, situated near Tule Lake, and Bonanza, situated on Lost River, within the so-called "upper project." The California & Northeastern Railway is now under construction to Klamath Falls.

YUMA PROJECT

President Roosevelt is responsible in a measure for the widespread interest in the delta of the Colorado River, having made it the subject of a special message to Congress last session. This region has been likened unto the wonderful valley of the Nile, which it so greatly resembles in soil crops and climate. The world is familiar with the catastrophe which threatened for a time to destroy a very large area in the lower valley, but few people appreciate the almost superhuman engineering feat by which this powerful stream was forced back into its old channel. This was accomplished by the engineers of a great railroad company, which placed at their disposal vast sums of money and almost the entire equipment of the system. Since the river was controlled the government work at Yuma and above has progressed rapidly. The great weir at Laguna is now within 700 feet of closing the river, and during low water stage this year heroic efforts have been made to complete this structure. The Laguna dam is interesting, as it is the first structure of this kind to be erected in the United States. It is similar to several weirs built by the English engineers in Egypt and India.

The project contemplates the reclamation of about 100,000 acres in Arizona and California. These lands are without question the most valuable in the country when watered. President Roosevelt, in his message to Congress, said: "The most conservative estimate after full development must place the gross production from this land at not less than $100 per acre per year, every 10 acres of which will support a family when under intensive cultivation. Much of the land will be worth from $500 to $1,500 per acre to individual holders." Yuma, the principal city in this section, is on the Southern Pacific Railway.

SALT RIVER PROJECT, ARIZONA

Let us in fancy visit this land of mystery, of lost races and hoary ruins, a land whose civilization was old perhaps when Caesar sat upon his throne. Starting from the charming city of Phoenix, in the heart of Salt River Valley, let us take a journey to the wonderful engineering works of this project. Leaving Phoenix by train, the Santa Fe or Southern Pacific railways, it is only a short ride to Tempe, where we may profitably pause a moment or two to get a broad view of the valley from the summit of the high butte just at the edge of the town. We note a peculiarity here as we gaze upon the cultivated fields. There are no farm houses on the farms. Here we find a return to the communal system of farm life, which was typical in the days of the cliff-dwellers and later in those of the Pueblo Indians. The farmer lives in town and goes to and from his small farm each day. Here at last the farmer's wife has her innings. She has the society of her neighbors, her children have graded schools, the church and library are at hand. There is no isolation, no loneliness. We find under these conditions also that there is no strong tendency on the part of the young men and women to drift to the crowded cities.

From Tempe to Mesa is another short ride by rail through a well irrigated section. Leaving Mesa in the early morning, when the air is fresh and sweet with the countless blossoms, we journey for a distance of 8 miles through a region where nature seems

to be ever at work producing varied and wonderful forms of vegetation. Just beside our window we note the magnificent date palm, its broad leaves bending in graceful curves and shading an abundance of luscious fruit. We are, indeed, in Egypt, for the date, you remember, was the bread of the desert. If we doubt, a little further along we come upon an olive orchard and just beyond the almond trees are in bloom, lending fragrance to an atmosphere already perfumed.

We pause to observe a large flock of ostriches wandering over an alfalfa meadow and rub our eyes to be sure we are really in our own country. More familiar to us appear the sleek, fat cattle standing knee deep in the cool alfalfa. This alfalfa is a wonderful crop down here, a veritable farmer's bank account frequently yielding 12 tons to an acre per year worth from five to ten dollars per ton.

We linger just a moment to gather a few oranges from the grove beside the road, and as we eat we wonder why such fruit never comes to our tables.

There is such a riot of color about this cottage that we want to stop long enough to ask the housewife how she can get roses to bloom in this wonderful way, but we have a long journey and we only learn that most farmers' wives in this valley, having both time and inclination, delight in beautifying their homes.

"THE LAND THAT GOD FORGOT"

All too quickly we have driven over this flowery, fruitful vale. With a suddenness that is startling we come upon a scene of death and desolation, where everything bears mute evidence of a terrible struggle for life. It is the land someone called "The Land that God Forgot." Everything that grows is covered with a thorn; everything that crawls is deadly; it is a topsy-turvy wonderland. We may not drink of the waters of the desert stream, for they are salty. In this strange region, they dig for wood and climb for water, for the water is found in cup-shaped pools in the hills and the wood is the big root of the mesquite.

For 20 miles our road, a government road, stretches across the desert and we begin to feel some of its compelling and pervasive mystery. There is a beauty and charm about it too, which cannot be described. The distant buttes are glowing richly red in the early morning light and the landscape, someone has said, "suggests a thought of God's original palette whereon he mixed the colors with which he brought forth the glories of a southwest sunset," the opal-tinted morn and the fairest shades of rose and green and yellow.

The desert vegetation is interesting. We come upon the sabaurra, the giant cactus, clothed from base to top with thorns, yet bearing delicate and waxen yellow blossoms. Singly and in pairs they grow, some attaining a height of 45 feet. Sometimes we find them in groves. The cliff-dwellers used the heart of this plant for floors in their houses.

Our first stop in the desert is at Desert Wells. It remained for our generation to discover that underneath these burning sands, and at no great depth, is an inexhaustible supply of water, fresh and sweet. At several points along our way the government has put down these wells to supply the needs of the thousands of men and teams constantly crossing the desert.

Rising straight up from the desert is a distant range of mountains. They seem to float above the edge of the level plain, intangible and unreal, yet transcendently beautiful in coloring and contour.

As we enter the mountain country glory after glory of view is presented. Changeful, charming landscape panoramas are unfolded before us. The colors illusive and divinely artistic, shift and change and blend as we gaze in wonder and amazement.

THE MOST WONDERFUL HIGHWAY EVER BUILT BY MAN

We are now entering upon what many travelers have described as the most wonderful highway ever made by man. A great thoroughfare built for 40 miles through the heart of a rugged range of mountains and for the most part literally carved from the living rock. As we go along note the coloring on the rocks, and believe me when I tell you the colors shown are not exaggerated, for it would be impossible for human artist to duplicate, far less to exaggerate, the colors which the Divine Hand has put upon these stones.

I need not tell you that road-building in a country like this was difficult; that fact stares you in the face at every point. When the surveying party reached the top of Fish Creek the engineer called a halt. He wanted time to think; and the problem before him demanded thought. He looked over the cliff into a blind canyon, into which there was not even a foot trail. A thousand feet sheer below him he could discover faintly a tiny stream of water and a few green trees. How was he going to get there with a wagon road over which tons and tons of machinery must be hauled. A hurried reconnaissance disclosed the fact that to go around the canyon meant adding 15 miles to the road. It was not to be thought of. So he decided to blast a road down the face of the steep cliff, and it was done.

It would be simply terrifying to go over the road today but for the fact that the government has built it broad and comfortable, with easy grades and many safe turn-outs, for standing here at the edge of the road a pebble slipped from the fingers shoots straight down a thousand feet without stopping.

At one point we get a view of the road almost to the blind end of the canyon, and can also see the line of road as it turns back on the other side. Just before we make this turn we cross a pretty little bridge 60 feet above Fish Creek. Down in the bottom of the canyon we find Frazier's Road House, a comfortable little inn, with good beds and a genial landlord. Here we shall spend the night. In this canyon, a miniature grand canyon of the Colorado, we will witness the golden glory of a sunset whose splendor will be impressed forever on our memory. Later we shall sit in the twilight and watch the stars steal forth in skies that seem to touch the walls of the canyon all around us.

The brooding mystery of the scene and the witchery of the hour will sink deeply into our hearts and color our dreams for many nights hereafter.

In the morning early we make our start to climb out of the canyon. Another panorama of mountains, uncanny buttes, steep-walled canyons, and narrow valleys passes before us. Freakishly shaped rocks, grotesque and awe-inspiring, tower above us. What wonder that the Indian viewed the country with superstition and awe!

At places we skirt dark chasms. Here the road has been cut from a rock that is milk white. Here the mountain-top was blasted off and the road built from the river up. Here we have a long swing on the edge of a profound gorge and as we pass along we are thankful indeed that our road is wide and safe.

Higher and higher we climb, every moment catching glimpses of difficult problems in road building worked out successfully. We pass through great cuts and here and there the road has been built up from below with masonry.

THE ROOSEVELT DAM AND OTHER MARVELS

Our road has brought us to the top of where the narrow gorge Salt River has cut through the mountains, and we look down upon one of the world's greatest engineering works in process of construction, the Roosevelt Dam. This wonderful structure of sandstone and cement will rise 284 feet above the river. It will be 1,080 feet long on top and 170 feet thick at the base. Its foundation will cover one acre of ground.

Placed by the side of a 20-story building it would rise ten feet above it, while its length on top would be more than two city blocks. Across its top will be a roadway 20 feet wide.

By day and by night the dull roar of dynamite breaks the deesrt stillness and the canyon walls go crashing down to furnish material for this structure. Great blocks of sandstone weighing ten tons each are swung out on cranes and set in place.

When night comes myriads of electric lights burst forth, weirdly illuminating a busy army of toilers, working gnomelike in a shadowy canyon. It is a wondrous scene, unreal, awesome and inspiring.

Every stone that is laid in that narrow arch, which is to curb that foaming river, brings nearer and nearer the day when the town of Roosevelt shall vanish beneath an inland sea.

When those massive gates of iron in the big dam, weighing 60.000 pounds, are

closed, a rising flood will cover the site of the city 220 feet deep. The people knew it was a doomed city when they built it, but this did not deter them. They built stores and dwellings, a school house and a church, and brought water from distant mountain springs.

This government work is interesting, not only to the engineer but also to the layman. It is located in a valley which has been the abode of three races, one of which lived here when Rome was young. Two of those wonderful cliff-dwellings are almost in sight of the modern structure that is soon to submerge some of the lands which formerly produced harvests.

Owing to the remoteness from transportation, the government engineer had to engage in many enterprises. He built roads to get machinery in. He sawed millions of feet of lumber from the national forests nearby. He turned farmer and raised his own produce, his hay, pork, beef and chickens. In the construction of the dam 240,000 barrels of cement are required and the lowest bid from the cement manufacturers was prohibitive. This engineer, undaunted, found a limestone ledge near the dam and proceeded to erect a cement mill. It has already turned out 80,000 barrels of cement at a cost far below the lowest bid.

Power was essential, so a dam was built 16 miles up stream, turning a part of the river into a power canal. The canal having less grade than the river, appears to carry the water up hill.

A part of it is line with cement. It crosses rough country in viaducts that makes us think of the works of ancient Rome. Near the dam-site it passes through a tunnel and downward into the mountain, a drop of 220 feet. The water falls upon the turbines located in a unique power house, a niche in the canyon walls and generates 4,400 horse power. The power is utilized by the contractor, it operated the cement plant, the electric light plant and is used for other purposes.

THE APACHE LABORERS

On the way to the saw mills we pass a number of salt caves, each of wonderful beauty. The salt is deposited by salt springs that the river takes its name for the waters of Salt River are too salty to drink but fortunately not salty enough to be injurious when used for irrigation.

The most difficult problem for the engineer to solve was the labor question. The common laborer did not like the job, chiefly, it is said, because he could not spend his money fast enough. This is a government reservation; there are no saloons; no gambling is permitted. There are no towns nearer than 60 miles, so he did not look with favor on the work. The real worth of the engineer came out when he turned missionary and held a pow-wow with the Apache Indians, who have lived in the basin for generations. It seems incredible, yet it is nevertheless true he succeeded in inducing several hundred of them to go on the pay roll, and, largely through their labors, the wonderful highway we just crossed over was built.

Some of the Apaches developed. Several, starting as common laborers, showed such industry and ability that they were promoted to responsible positions, as road supervisors in charge of their own tribesmen on difficult road work.

There is something like poetic justice in the labor of the Indian with pick and shovel to reclaim a valley he so often watered with the blood of the white man.

While the braves are working for the government on the road, in the cement mill, the brick yard, and elsewhere, the squaws weave wonderful baskets, which find ready sale in the camp and in the valley below.

Sixty miles below Roosevelt another enormous structure is rapidly nearing completion. It will divert the stored waters into canals on each side of the river which lead it to the fields below. One of these canals was partly excavated by the cliff-dwellers. Think of the patience and time they must have expended in a work like this, when their only implements were of stone.

Settlers are already erecting their homes on the desert, and soon we shall call this

the land that God remembered, for with water from those distant mountains stored in vast reservoirs and led through a thousand miles of canals and ditches, the desert will smile, oases of green will spring forth and homes of beauty and peace will dot the landscape.

TERMS OF SALE OF GOVERNMENT LAND

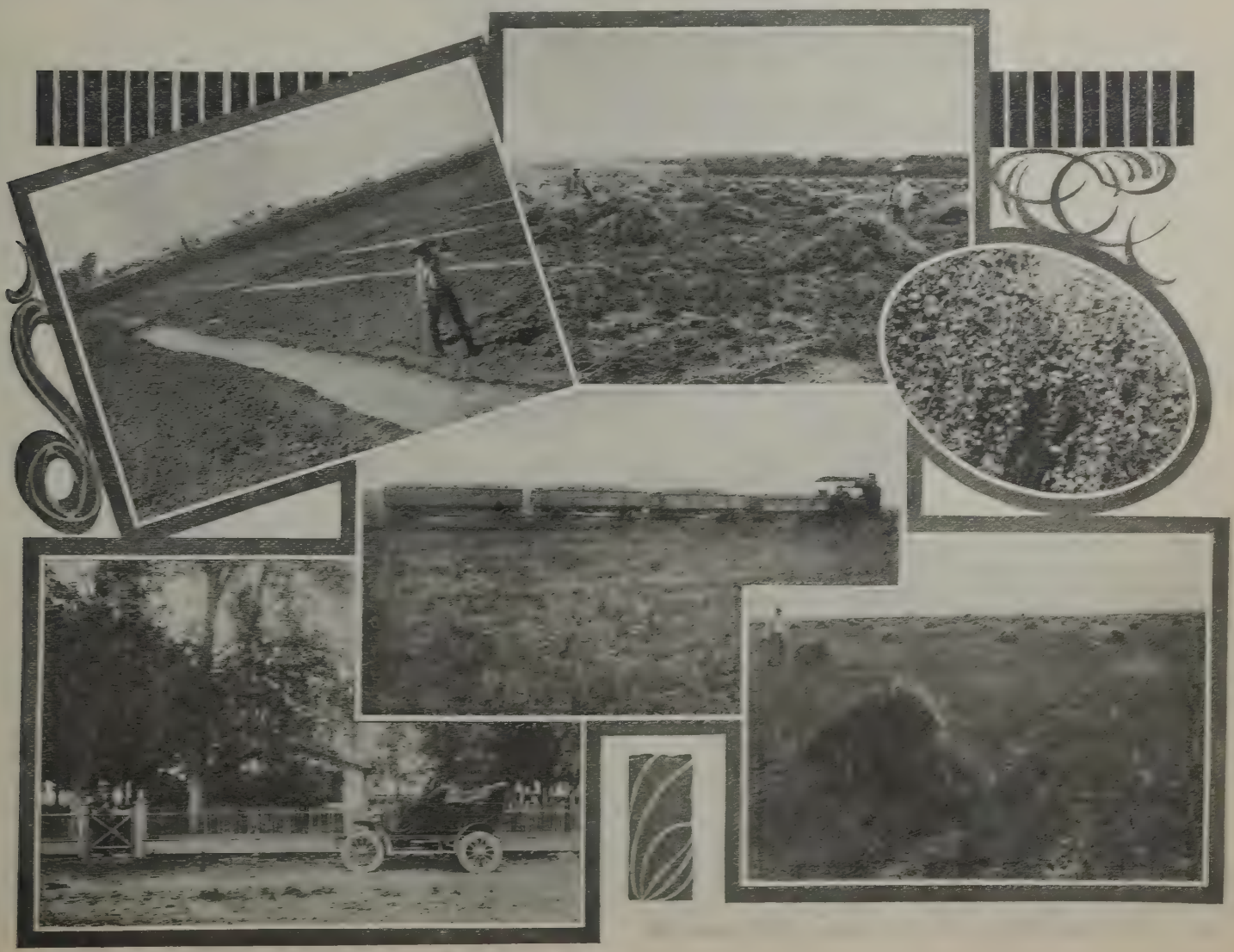
If the thousands of inquiries which are addressed to the Statistician of the Reclamation Service, at Washington, D. C., can be accepted as any indication, the West will be the Mecca for homesteaders this year. Many other projects of the government which are ready for irrigation contain large areas of land for sale by private owners who are under agreement with the United States to dispose of their holdings. By the terms of the Reclamation Law no farm will contain more than 160 acres. Every settler must reside upon the land and must cultivate it for five years before he can secure a patent. The homestead rights of soldiers and sailors are not abridged by the Reclamation Act. Homeseekers should have money—how much depends, of course, upon the settler and the kind of farming he expects to do. While there are numerous opportunities to secure work, the settler with money and equipment will be able to get his land in condition for irrigation and will thus secure an early income from his farm.

A knowledge of irrigation is not absolutely essential. The government will have a practical farmer on each project to advise newcomers. On several projects there are demonstration farms on which are grown the crops adapted to that section. During a portion of the year the government will give employment to settlers in constructing canals, laterals and building roads.

SUMMARY OF WORK DONE

A summation of the work of the Reclamation Service for 1907 shows that it has dug 1,881 miles of canals, or nearly the distance from Washington to Idaho. Some of these canals carry whole rivers, like the Truckee in Nevada and the North Platte in Wyoming. The tunnels excavated are 56 in number, and have an aggregate length of 13 1-2 miles. The service has erected 281 large structures, including the great dams in Nevada and the Minidoka Dam in Idaho, 80 feet high and 650 feet long. It has completed 1,000 headworks, flumes, etc. It has built 611 miles of wagon road in mountainous country and into heretofore inaccessible regions. It has erected and in operation 840 miles of telephones. Its own cement mill has manufactured 80,000 barrels of cement and the purchased amount is 430,000 barrels. Its own saw mills have cut 3,036,000 feet B.M. of lumber, and 23,685,000 feet have been purchased. The surveying parties of the service have completed topographic surveys covering 10,970 square miles, an area greater than the combined areas of Massachusetts and Rhode Island. The transit lines had a length of 18,900 linear miles, while the level lines run amount to 24,218 miles, or nearly sufficient to go around the earth. The diamond drillings for dam sites and canals amount to 6,749 feet, or more than 12 miles. Today the service owns and has at work 1,500 horses and mules; it operates 9 locomotives, 611 cars and 23 miles of railroad, 84 gasoline engines and 70 steam engines. It has constructed and is operating 5 electric light plants. There have been excavated 42,447,000 cubic yards of earth and rock. The equipment now operated by the service on force account work represents an investment of a million dollars.

This work has been carried on with the following force: Classified and registered service including Washington office, 1,126; laborers employed directly by the government, 4,448; laborers employed by contractors, 10,789, or a total of all forces of 16,363. The expenditures now total nearly $1,000,000 per month. As a result of the operations of the Reclamation Service eight new towns have been established, 100 miles of branch railroads have been constructed, and 14,000 people have taken up their residence in the desert.



Some Results of Irrigation

The following is a list of the approved projects on which construction has been commenced. The table shows the irrigable area of the projects to the points to which it is expected to carry them during the four years, 1908 to 1911; the estimated cost to complete the work to these points; the estimated expenditures to the end of the calendar year 1907, and the percentage of completion, December 31, 1907, based upon the ratios of the expenses to that date to the total estimated cost:

Areas, Cost, Expenditures, etc., on Entire Projects or Such Units as it is Expected to Complete by 1911.

LOCATION	PROJECT	Area in Acres	Estimated Cost	Estimated Expenditure to Dec. 31, 1907	Per Cent of Completion
Arizona	Salt River	210,000	$ 6,300,000	$ 4,362,100	69.2
California	Orland	30,000	1,200,000	16,900	1.4
California-Arizona	Yuma	100,000	4,500,000	1,876,700	41.7
Colorado	Uncompahgre	140,000	5,600,000	2,900,000	51.8
Colorado	Grand Valley	50,000	2,250,000	9,750	.4
Idaho	Minidoka	160,000	4,000,000	1,839,700	46.0
Idaho	Payette-Boise	100,000	3,000,000	1,381,500	46.5
Kansas	Garden City	8,000	350,000	282,000	80.5
Montana	Huntley	30,000	900,000	796,400	88.4
Montana	Milk River, including Saint Mary	30,000	1,200,000	314,800	26.2
Montana	Sun River	16,000	500,000	344,100	69.0
Nebraska-Wyoming	North Platte	110,000	3,850,000	2,797,300	73.0
Nevada	Truckee-Carson	160,000	4,800,000	3,804,600	79.2
New Mexico	Carlsbad	20,000	640,000	579,400	81.5
New Mexico	Hondo	10,000	370,000	358,600	97.0
New Mexico	Leasburg	10,000	200,000	167,900	83.9
New Mexico-Texas	Rio Grande	160,000	8,000,000	53,200	.6
North Dakota	Pumping, Buford-Trenton, Williston	40,000	1,240,000	519,600	41.9
Montana-North Dakota	Lower Yellowstone	66,000	2,700,000	751,850	64.9
Oregon	Umatilla	18,000	1,100,000	765,500	69.6
Oregon-California	Klamath	120,000	3,600,000	1,305,080	36.2
South Dakota	Belle Fourche	100,000	3,500,000	1,281,900	36.6
Utah	Strawberry Valley	30,000	1,500,000	418,700	27.9
Washington	Okanogan	8,000	500,000	372,180	74.4
Washington	Sunnyside	40,000	1,600,000	481,180	30.7
Washington	Tieton	24,000	1,500,000	565,420	37.6
Washington	Wapato	20,000	600,000	5,220	8.7
Wyoming	Shoshone	100,000	4,500,000	2,313,990	51.5
		1,910,000	$70,000,000	$30,665,570	51.5

An average of $36.65 per acre.

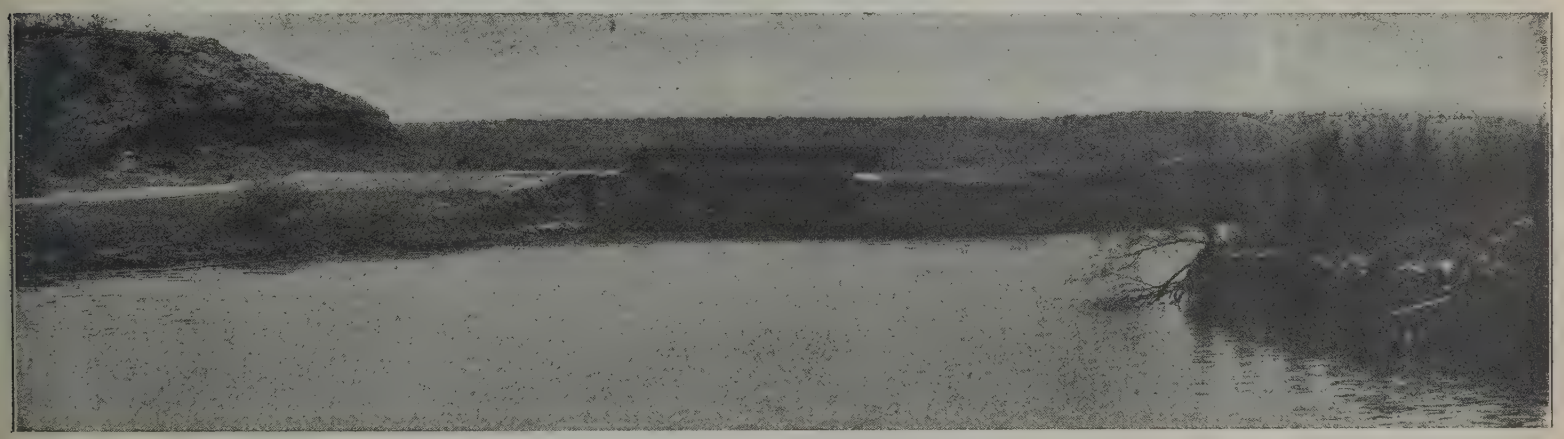
Where Irrigation Is King
A Story of Private Enterprise

By R. E. WILSON, Industrial Department, The Atchison, Topeka and Santa Fe Railway Company.

No one desiring to keep in touch with the most vital economic problem of the day can afford to pass over this article. It contains valuable facts and figures and much pertinent information—presenting for the first time to the public a history of irrigation under private enterprise in the Southwest.

TAKE a map of the United States and with a knife cut along the lines indicating 102 and 125 degrees of West longitude from the British domains to the Mexican border, and you will have a fairly accurate map of Arid America. This area contains about one-third of Continental United States, and is approximately one thousand miles square. It contains the greatest forests, the richest mineral deposits, the widest variety of raw materials for manufacturing and the most fertile soils to be found in America, and perhaps in the world. It is deficient only in rainfall. About one-third of this territory is arable, as much more is pastoral and the remainder is mountain and desert. It includes within its confines eleven entire states, and portions of four. This section presents a wider range of climate, altitude, resources, and industrial possibilities than any like area on the globe. It is practically unveloped, and industry has only begun.

To irrigation it owes its present stage of progress almost entirely, and on irrigation will be based its future. What has already been accomplished by private irrigation enterprise in this country is wonderful, and in importance is second only to the marvel of erasing the desert from our maps, and making productive what a quarter of a century ago was almost entirely a dreary waste.



Headgate of Big Valley Irrigation Ditch, Near Pecos, Texas

Irrigation is as old as civilization, and more than one-half of mankind has lived by it for thousands of years. To those whose ideas of irrigation encompass a garden hose and a sprinkling pot, it at least will be interesting to know that it was extensively developed in the Southwest, and afforded the basis for a civilization, centuries before Columbus sailed from Spain. But the average American doesn't know, and probably doesn't care anything about irrigation as an ancient art. We are up against it as a practical economic proposition of today and tomorrow.

Nobody seems to know just how much land is under irrigation in the United States today, but there are about one quarter of a million farms growing crops by it on fifteen million acres, in round numbers. This area is scattered over the million-square miles of territory already spoken of. If in a solid body it would be greater in area than New Hampshire, Vermont, and Connecticut combined, or about the size of the State of Maine. If you will remember that men of Anglo-Saxon origin did not begin to irrigate in the United States until 1847, when the Mormons settled in what is now Utah; and that until Horace Greeley started, in 1874, the Colorado colony which bears his name, irrigation was regarded by Americans as the puerile makeshift of a God-forsaken people who knew no better and had to do it—the marvel of the achievement may be grasped.

It cost about seven thousand dollars for Columbus to discover America, but it has cost nearly one hundred and sixty million dollars to put irrigation on the quarter of a million farms served, and in doing it main and branch line canals have been built equalling in length the 215,000 miles of American railways.

To write the story of irrigation in the West would require a year's time, much more than a year's investigation, and would occupy volumes. Herein will be touched upon but two states—Colorado and California wherein irrigation has been the most highly developed—and the Territories of New Mexico and Arizona, where its extensive application has just begun.

COLORADO. In the extent of its irrigated area and the length of its canals, Colorado holds first place among the arid states. There are approximately three million acres of land under irrigation in Colorado, served by 13,000 miles of canals, the cost of construction of which is estimated to be about thirty million dollars. Agriculture, which is now the leading industry of the state, and contributes annually about eighty million dollars to its wealth, is practically all by irrigation.

About two-thirds of Colorado is mountainous; the remainder, or eastern portion, is occupied by the Great Plains, and on them irrigation within the state is most highly developed. The state is divided into nine drainage basins, only one of which, that of the Arkansas, will be touched upon. In this basin, the finest examples of irrigation in the state are to be seen.

Rising in the higher slopes of central Colorado, the Arkansas River on leaving the mountains traverses the southeastern portion of the Great Plains in a generally easterly direction, imperceptibly diminishing in grade and increasing in breadth and volume. It flows through Colorado a distance of over 350 miles, and just east of the town of Holly passes within the confines of "that grassy quadrangle geographers called Kansas." Approximately one-half of the agricultural wealth of the state is produced on lands watered by the Arkansas and its tributaries, and into them head about 850 irrigation canals. With a total length of nearly three thousand

miles, they carry its stream to more than three quarters of a million acres of soil born of the disintegration of the Rocky Mountains.

The values of irrigated lands on the Arkansas range from $60 to $350 per acre, and on them with a minimum of labor are produced crops more than justifying these values. The lands produce sugar-beets, wheat, alfalfa, corn, barley, sorghum, flax, oats, cantaloupes, watermelons, apples, peaches, plums, nectarines, etc., all in abundance. Six enormous beet-sugar factories afford a cash home market for what is perhaps the most valuable crop grown in the valley, and several additional factories are under construction or contemplated for the near future. Coincident with the establishment of the sugar industry, cattle and sheep feeding developed, both in this portion of Colorado and immediately across the state line in Kansas, where about 60,000 acres are watered.

Cities and towns of industrial and commercial importance are founded on the utilization of the waters of the Arkansas, and a thousand acres; length of main canals about four thousand miles, amount spent, about eight million dollars.

The northern and eastern portion of the Territory, a practically level floor built by the silts of the ages, is traversed, drained and a small portion irrigated, by the Cimarron, Canadian, and Pecos rivers, and their numerous tributaries. There are about seventy-five thousand acres under ditch in the northern section, scattered like emeralds over a territory of vast extent and marvelous richness, served by six hundred miles of canals, the construction cost of which is about one million dollars.

Practically the best and most modern examples of practical irrigation within New Mexico are to be seen in the valley of the Pecos. Like most other irrigated districts, this was once a desert, then a cattle country where the legitimate livestock industry was varied by the more exciting diversion of chasing, and being chased, by out-

Irrigation Scene in Rio Grande Valley

population of about 200,000 is sustained with an assessed property valuation of fifty million dollars. The history of this marvel of private achievement, (for there are no Government projects in the valley of the Arkansas, except at Garden City, Kansas), is contained in the past twenty-five years.

The storage of flood and storm waters on the Arkansas has only begun, but approximately four billion cubic feet of water is so conserved annually. The principal storage system consists of six reservoirs, covers over 14,000 acres of land 90 feet at the greatest depth, the total shore line being 60 miles. The water stored by them would cover, one foot in depth, more than a quarter of a million acres of land.

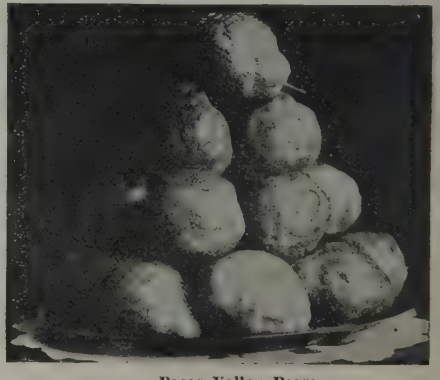
Work is now progressing on enterprises which will ultimately add a quarter of a million acres of additional land to the area now watered. The underflow waters of the valley have hardly been tapped, and in this, and the further storage of the floods, the future lies.

New Mexico. To the physical geographer, New Mexico divides by the crests of the Rocky and Sierra Madre mountains into three distinct sections—the eastern, an extension of the Staked Plains of Texas, the basin of the Rio Grande, and the Western Plateau. A large portion is treeless and with the exception of small areas it is four thousand or more feet above the level of the sea. The average rainfall is about fifteen inches. Its rivers are not large, and are of torrential character. It is well within the arid region, and its area is 122,460 square miles.

While irrigation in New Mexico is the oldest in the United States, it is not extensively developed for a number of reasons, any one of which is amply sufficient, and which are to be referred to later. The area under ditch today is a little over four hundred

laws; it is now a garden. About 1888, the cattle business having become temporarily unprofitable, attention was turned to agriculture, and it was then irrigation began. From the arrival of farmers, or what the cattle men were pleased to term "pun'kin rollers," the progress of the section dates. From a few isolated patches the irrigated area has extended until today there are about eighty thousand acres served from five hundred miles of canals heading into the Pecos River and its tributaries, and twenty thousand acres from six hundred artesian wells. Exclusive of the improvements made by the Government, about four million dollars have been expended on its irrigation systems.

The Rio Grande Valley occupies first place in number of irrigators, acreage served, and length of canals. Rising in Colorado it flows through the entire length of New Mexico. Upon its introduction into the Territory it passes through a series of long, deep canyons to emerge near Embudo. Thereafter it possesses the characteristics of a typical desert stream—"too thin for successful cultivation, too thick for a constant beverage, and reasonably deep if turned on edge." It is not to be assumed from the foregoing that the Rio Grande



Pecos Valley Pears

carries but little water—no greater error could be made. The volume of its flood is enormous and its constant flow, while large, is mostly in the gravels beneath its bed.

Today there are about one hundred thousand acres irrigated from the Rio Grande, the waters for which are led through one thousand miles of canals, built at a cost of over one million dollars. The greater part of this acreage is in what is known as the Mesilla Valley—one of those favored sections high enough to escape humidity and far enough south to protect it from severe cold.

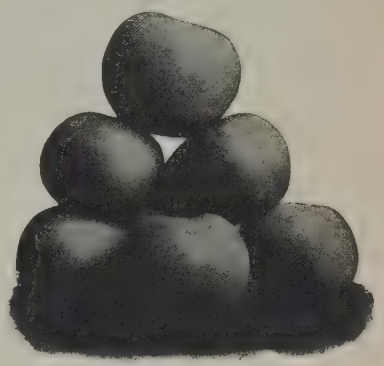
Two of the most surprising things noticed by the newcomer in the Rio Grande country is the wonderful opportunity for the utilization of its waters, and the limited extent which this opportunity has been taken advantage of. There were two principal reasons which held irrigation back on the Rio Grande below Albuquerque. The first was an ancient treaty with Mexico by the terms of which the storing of flood waters was prohibited for the ridiculous reason that such storage interfered with the navigation of the stream. The only navigation on the Rio Grande is about one thousand miles south of the southern boundary of New Mexico. This treaty has at last been abrogated, "for which relief much thanks." The second reason for its limited development was the unsettled condition of title to most of the lands which could be benefited, which has also passed away. The control of the river and its use for the beneficial purpose of irrigation is now assured, and on it some of the greatest government projects are to be built.

In addition to the districts described, there are about twenty thousand acres under ditch, west of Albuquerque along the line of the Santa Fe Railway, and perhaps seventy-five thousand more scattered elsewhere over the Territory.

The future of irrigation in New Mexico, is one of great promise, to be fulfilled by the storage of its floods, the development of the underflow, and the use of capital to which it offers such an attractive field.

ARIZONA. Arizona has slightly less land under irrigation than its eastern neighbor, New Mexico—that is, three hundred and fifty thousand acres, or about four-tenths of one per cent of the total area of the Territory. Arizona is a country of plateau and plain, with several short, irregular mountain ranges extending from the southeast to the northwest. More than one-half of Arizona has an elevation of five thousand or more feet, constituting the Colorado plateau, and the balance is made up of valley and plain. The Territory as a whole dips to the south and southwest. With the exception of the Gadsden purchase, which came later, it was ceded to the United States by Mexico, in 1848. All but sixty miles of its western boundary is formed by the Colorado River, one of the largest rivers in the West, which drains nearly the entire Territory, and on one of the tributaries of which—the Salt River—irrigation is most largely developed.

Irrigation in the Salt River Valley afforded the basis for a large population over a thousand years ago, and many of its ancient ditches are in use today. One hundred and fifty thousand acres watered, seven hundred and fifty miles of canals built at a cost of three million dollars (exclusive of the great Tonto Basin project of the Government) are the monuments to private enterprise in the Salt River Valley. Crops of alfalfa, barley, corn, oats, and wheat in its rich soil and favorable climate immediately succeed each other as fast as planted and irrigated, and all the orchard fruits, grapes, and semi-tropical crops do well.



New Mexico Apples

Aside from the irrigated areas in the Salt River Valley, there are about twelve thousand acres on the Colorado in the west, as much more on the Little Colorado in the north, ninety thousand acres on the Gila in the south, and the balance is scattered along numerous small tributaries of these streams. There are about 2,500 miles of canals in Arizona, built at a cost of six million dollars.

Irrigation in Arizona has hardly begun. It is estimated over one million acres can be brought under ditch in the valley of the Salt River alone. The Colorado and the Gila have hardly been tapped, and the extent of the underground water resources is inconceivably great.

The appalling greatness of Arizona's plains, and the small amount of land developed on them, causes many unfamiliar with the Territory to consider agriculture on them hopeless, and at the same time they fail to realize what a large percentage of land in the east is uncultivated. Dr. A. Roth, before the American Forestry Association, has pointed out that in the older states, where presumably all the tillable area has been developed, there is yet a large proportion of the land uncultivated. In Maine the uncultivated portion amounts to 88 per cent of the total; in Massachusetts it amounts to 77 per cent; in Pennsylvania to 55 per cent and in Virginia to 61 per cent. Farming in those states is all under rainfall, or "natural conditions." If the mind can once be dissociated from the vastness of Arizona's plains and be brought to thoroughly consider a small area, the hopelessness of the task will in a large measure disappear. An examination of its soil reveals that it is one of exceedingly great strength and richness; the vital elements of plant growth—light and air—exist in greater measure perhaps than elsewhere on this continent; irrigation only is required, which is practically the reverse of drainage in the east, and just as "natural."

The greatest problem remaining to be worked out in Arizona is

Cutting Alfalfa in the Mesilla Valley, New Mexico.

that of water storage. Expense rather than engineering difficulties has held irrigation back, but this is constantly growing less and the day of construction is at hand.

California. California, in number of acres irrigated, ranks second among the states. About two and one-half million acres are irrigated, of which five hundred thousand are served by wells, and the balance from rivers. Forty-five thousand farms make up this acreage, to supply which ten thousand miles of ditch and immense controlling works have been built at a cost of approximately thirty million dollars.

One-half of the irrigable lands in the State lie in the San Joaquin Valley in Central California. This wonderful valley contains, then, about one and one-quarter million acres of the richest irrigated land on the globe. Three thousand and five hundred miles of canals, over five hundred irrigation systems, and twelve thousand farms will represent approximately what has been done to transform this valley from a cattle range to the most productive section of a wonderfully productive agricultural state. About twelve million dollars have been spent on its irrigation works.

Of the one and a quarter million acres said to be under irrigation in the San Joaquin Valley, about one-half draw water from canals heading into the Kings River, and the balance are served from the San Joaquin, Kern, Fresno, Merced, and Stanislaus rivers. The San Joaquin River, to which all the before mentioned rivers are tributary, drains an area of over sixteen hundred square miles. Flowing north it meets the Sacramento which flows south to the union in the middle of the San Joaquin Valley, and turning to the west winds its way to the Bay of San Francisco.

The valley to which this river gives its name is not a valley in

An Irrigated Orchard in New Mexico

the usually accepted sense of the term. It is rather to be described as a great plain walled in by mountains. Its floor contains twenty-one million acres, about one-half of which is available for agriculture and irrigation. It is larger than Maine, and of greater productive power than all New England. On the limited area cultivated, it produces more barley and wheat than double the area in any central or eastern state in the Union. In addition it is a prominent producer of oranges and deciduous fruits, supplies the entire national demand for raisins and prunes, exports twenty million gallons of wine annually, is a great cattle, sheep, and dairy country, and within it are some of the greatest petroleum fields ever discovered.

The San Joaquin Valley presents a marvelous example of the productive power of land under irrigation. The story of its achievements never has been half told. It has been claimed that the San Joaquin Valley could support a population of twenty millions. From what has been accomplished at a few points within it, this does not seem unreasonable. The resources of the valley are just being opened up, and irrigation while largely developed, has not more than demonstrated in a small measure what its future will be. In addition to the further use of the waters of its streams, the great underflow should not be forgotten. In this connection *the fact that it is a country of cheap and abundant fuel oil is of the greatest importance.*

Irrigation of the Future in the Southwest. A few decades ago the Southwest was a place of terror, without railroads, schools, churches, laws or social institutions—a howling wilderness. All this has passed away and the conditions, manners and customs connected with its settlement have changed.

The largest and most attractive portion of the two-thirds of a billion acres of land remaining in the public domain is in the Southwest. In addition to this is the enormous amount of land belonging to the individual states and included in private land grants. With irrigation and immigration and the assistance of the railroads we hope to annex to our agricultural and commercial domain this country of undreamed of potentiality.

Irrigation in the Southwest has passed through the eras of pioneering and experiment to permanency. To call the country "arid" is no longer slander, and the term "desert" does not mean the soil is poor. It is impossible to say what percentage of Arid America eventually will be under irrigation, or be in cultivation under methods it inspired. Even the fuel resources of the Southwest are not definitely known today, the flow of many of its water courses is unmeasured, and large portions of it have not been surveyed. About 40 per cent of land under irrigation today is injured by too much water, and probably 50 per cent of the water diverted from streams is lost by seepage and evaporation, which if saved would about double the present area. Great storage projects which, under present conditions and cost of construction are impossible, are to be built.

The mechanical devices for handling material, which have been developed in the past twenty years, are to be outdone and contribute their aid to the cause of irrigation. Ten years ago hardly a barrel of Portland cement was made west of the Missouri River, and a reduction in cost of this one item alone would make the building of many projects feasible. Kansas is now making twenty thousand barrels daily of the highest grade of cement, and doing it for less than fifty cents a barrel; eventually many of our arid states will do the same. Wind, not hot air, the gasoline engine, and the pump of the future actuated by the cheap and high power industrial alcohol, will yet redeem millions of acres of land by bringing to the surface, water of the underflow.

The development of agriculture without irrigation in the Panhandle of Texas, in Western Kansas and the High Plains of Colorado and New Mexico has not been because of a change in climatic conditions or the moving of the rainbelt westward. The climate and rainfall have not changed and will not unless the causes of the aridity of those sections, which are as constant at its mountains, first undergo a change. But irrigation has shown us with what a small amount of moisture land will produce bountifully under thorough tillage, and is largely responsible for the success of farming in those sections of the southwest where irrigation is not, and probably never can be, practiced.

In the Great American Desert, the country known to cheap politicians and car window investigators as "the scrap heap of the nation" and "the land that God forgot," an evolution is in progress. The trotting horse and the fat hog are two distinct types of animals evolved by the American, and it is not unreasonable to assume he will evolve distinct types of vegetable life adapted to the conditions of rainfall, climate, and altitude of the desert. According to those who claim to know, there are 197 distinct species of plants which not only grow in the desert, but will not thrive outside it. Luther Burbank, the Wizard of California, is developing some of these plants into valuable aids to man. Each year one or two new and valuable agricultural crops are demonstrating their adaptability to arid conditions. From the Steppes of Russia and Siberia, from the tablelands of Turkestan and South Africa, new crops are being brought to the Southwest where conditions of aridity are similar. Macaroni wheat alone, which yields 15 bushels to the ace on ten inches of rainfall, will revolutionize the value of millions of acres of arid land, and it is claimed it can be grown in the West over a territory of a million square miles.

All the old conditions, difficulties, and obstacles are being overcome and removed; the element of distance has been eliminated; conditions of life and social opportunity are being leveled up to conditions elsewhere; upon its fields and workshops accessible markets are waiting. Across the American continent, into the country where Coronado marched, the land Pike explored, along the pathway of Lewis and Clarke, a mighty arm is moving. Not a devastating force, but a conquering arm of peace guided by the energetic agents of business. They represent the best of American brains and energy; to them open opportunity offers its richest prizes, and a willing future invites them to win.

Agriculture in New Mexico

By J. J. VERNON

THE STATES AND TERRITORIES in the arid and semi-arid belt have attracted much merited attention in recent years. Since the inauguration of great irrigation enterprises in the West, and more comprehensive systems of utilizing irrigation waters have been instituted it is recognized the country over that it will have to reckon seriously with the States and Territories in the arid and semi-arid sections of the United States in the future from an agriculture standpoint. The eastern farmer and stockman have felt the competition of the West and are trying to adjust themselves to the changed conditions. Eastern bankers do not find the strong demand for money in the West at harvest times as formerly, and they are seeking other fields for investment. The western farmer has money with which to move his crops. The West is practically out of debt. This, in a great measure, is due to the great resources of the West, largely agricultural, that have long lain undeveloped. The history of the Western States is practically the history of New Mexico.

New Mexico agriculture is attracting more attention today than at any former time. Homeseekers are flocking to the Territory in great numbers, preempting and purchasing large areas of land in our fertile valleys, and building up new agricultural communities of considerable importance. New Mexico may properly be called an agricultural Territory, to the truth of which the following facts attest:

New Mexico Agriculture

STOCK RAISING. Stock raising, owing to the great areas of land that can never be brought under the plow, will probably remain one of the leading industries of New Mexico for many years. Of the 27,914 persons engaged in agricultural pursuits, 8,107 are occupied in raising live stock. This number is likely to increase, for in New Mexico, as has already been the result in many parts of the west, the individual holdings of free range inevitably will diminish, while the number of individual holdings will grow larger. This will tend to unite the small range with the valley ranch under one management, a system which, if it becomes general, has the following points of merit:

(1) The infusion of better blood into the stock on the range.

(2) Droughty periods would lose much of their terror.

(3) Greater numbers of animals could be finished and slaughtered for home use, shutting out foreign meat, and

(4) Fewer unfinished animals would remain to be shipped and sold as stockers, resulting in the price of stockers ruling higher.

FEEDING. The last few years have seen considerable progress in feeding for home market and for shipment. The Pecos Valley probably leads the other parts of the Territory in feeding stock for market. The last two or three years several hundred head of cattle and many thousand head of sheep and lambs have been fattened for the Kansas City market, netting profitable returns to the feeder.

DAIRYING. Dairying has kept pace with the demand in the vicinity of the cities and towns where the products are sold in the form of milk and cream. There is not enough butter and cheese manufactured to supply the demand, although there has been a considerable increase in their production. In 1889 there were maunfactured 105,000 pounds of butter and cheese. This number swelled to 381,000 pounds in 1899.

POULTRY AND POULTRY PRODUCTS. Annually thousands of dollars are poured into the pockets of Kansas and Nebraska farmers in payment for poultry and eggs consumed in New Mexico, yet we have an ideal country for poultry raising. We have most of the advantages with few of the disadvantages of other sections. Insect pests are no worse, while disease of any kind is rare. Prices are high, being governed by the price of foreign product plus the transportation charges, therefore the home product has an advantage. It is evident that the New Mexico farmer is taking advantage of these favorable conditions, for the number of fowls increased 250 per

cent from 1890 to 1900 and the number of dozens of eggs increased from 280,000 to 840,000, yet there is need of a greatly increased production.

APIARIAN PRODUCTS. With our mild winters and abundant bee pasture, in the form of alfalfa, tornillo, etc., the apiarian products have increased over sixfold in ten years and are of considerable importance over all the cultivated areas of the Territory.

ALFALFA. Much has been written about alfalfa. It is known more or less in every state in the union, and therefore I need not go into a detailed description. Alfalfa is grown in all the irrigated sections of New Mexico up to an altitude of over 7,000 feet. It is also grown considerably in dry farming sections where there is no irrigation. In New Mexico alfalfa does well in almost every class of soils. The chemical constituents of the soil seem to have little to do with the growth of the crop, provided the surface is level and the proper amount of water is given. It grows well on light, sandy loam, as well as on the heaviest adobe. It is said by an able writer that alfalfa will not stand "wet feet." That is true if he meant it would not grow in water-logged soil. Where the soil is well drained it will extend its roots to the water table and grow luxuriantly where the water table is only a few feet below the surface of the ground. One might expect alfalfa to fail in heavy clay soil, and it probably would if the soil was not well drained.

The area of alfalfa in New Mexico increased from 12,139 acres in 1890 to 55,467 acres in 1900. The average yield in the Territory is about 3 tons per acre. The cost of production, including taxes, water rent, growing, harvesting, bailing and placing on board the car, does not exceed $4.00 per ton. There are some large alfalfa farmers that are able to place alfalfa on the car at a much less figure becuse they have perfected their system of irrigation and handle the hay with improved machinery.

The net profit of growing alfalfa under our irrigation systems is considerably larger than the average net profits realized on wheat and corn in the older agricultural sections. It is a crop that requires little labor, if the field has been made level and the soil well prepared before seeding, after which the operations are simple, resolving themselves into irrigating and harvesting. On many soils one irrigation will produce one crop, which may vary from one-half to two and one-half tons per acre. The price of alfalfa varies in different parts of the Territory, depending upon the production, amount consumed by stock being fattened, and the shipping facilities. The demand for alfalfa, aside from that for local consumption, comes from cities and towns, mining and railroad camps, and the thousands of isolated stock ranches scattered over the arid and semi-arid sections, as well as a considerable demand from portions of Texas and the Republic of Mexico. At harvest time the price of alfalfa is comparatively low, usually not exceeding $8 per ton, but the forehand farmer who holds his product until winter usually gets from $10 to $13 per ton. Alfalfa farming has proven very attractive and profitable, and it is not surprising that the area should increase from 12,000 to 55,000 acres in ten years.

As to the feeding value of alfalfa I need have nothing to say, since it is conceded throughout the country that alfalfa leads all other forage crops in its total digestible food constituents and nitrogen contents.

CORN. Corn stands next to alfalfa in acreage and value of total product. Where water for irrigation is plentiful the yield of corn in New Mexico compares favorably with the yield of this crop in the corn belt. Where there is plenty of water this is a paying crop.

Kaffir corn grows as well if not better than corn. In some sections of the Territory it is grown almost exclusively for feeding stock. In the Pecos Valley kaffir corn is one of the leading crops. It yields from 25 to 50 bushels per acre, besides producing a large quantity of excellent stover. Both the grain and stover are fed to cattle and sheep in the fattening pens. Kaffir corn is an excellent drought register.

WHEAT. Wheat is a sure crop in New Mexico if sown early. The yield of wheat per acre in New Mexico is equal to the yield in the leading wheat-growing states. Its production, however, is handicapped by the antiquated method employed in harvesting and threshing. Perhaps 90 per cent of the entire wheat crop of the Territory is harvested with hand sickles, threshed by treading with horses or goats, and cleaned by winnowing in the good old style that Noah used. Self-binders and power threshers are in use in some sections of the Territory, and with the general use of such machinery the growing of cereals will become more extensive and profitable. It has been demonstrated by the agricultural experiment station,, as well as by several farmers, that the self-binder will work over the irrigation borders successfully. Nearly all of the cereal crops grow well here, and there seems to be no good reason why machinery should not be more generally employed in harvesting and threshing these crops.

POTATOES. By many the potato has been considered an impossible crop in New Mexico, and yet the value of the potato crop in New Mexico in 1899 was nearly $50,000. The difficulties in growing potatoes seem to be those of varieties and management under irrigation. Colorado failed in her first attempts to grow potatoes, but now this crop forms an important source of wealth to her. Sweet potatoes are grown here without difficulty.

ORCHARD CROPS. There were 719,057 bearing fruit trees in 1900, which produced 263,870 bushels of fruit. The value of all orchard products in 1899 was estimated at $197,331. There is a noticeable increase in the amount of dried and evaporated fruits, which indicates that culls and unmarketable products are being more generally utilized. In the near future we will probably be able to supply our own markets with jams, jellies, marmalades, etc., manufactured from such fruits as generally go to waste, thus effecting a great saving.

VEGETABLES. All kinds of vegetables are successfully grown and our mild winters render the growing of winter and early vegetables an important occupation which furnishes employment for a large number of persons.

VITICULTURAL PRODUCTS. There were 1,186 acres in bearing vines in 1890 and 9,000 acres of young vines. The total value of property devoted to this industry in 1890 was estimated at $3,055,800.

NEW CROPS. Tobacco, cotton, and hops.—While it has been known that these crops could be grown, yet they have never been planted on sufficiently large areas to demonstrate their value. In the vicinity of Albuquerque several acres of tobacco are being grown this season and definite results can be expected.

Growing cotton will be confined to the southern and eastern limits of the Territory. Valuable conclusions will no doubt result from the crops being grown in the southern Pecos Valley this year.

Hops will grow well and fruit heavily. It would seem to be a promising crop for this section.

DIFFICULTIES. It would be untrue to say that New Mexico has no difficulties to encounter. The difficulties in New Mexico, however, are those usually met in any partly developed country. We have few railroads, and the distance to large markets is great. We need more labor-saving machinery and a better knowledge of how

Sugar Beet Field

to use it. The greatest hindrance to progress, however, is the irregularity of the flow of our streams. They overflow their banks running to waste in winter and in flood seasons, and too often dry up in midsummer. We need to interest capital in the development of irrigation systems in the Territory or secure Government aid in the following irrigation enterprises:

(1) For building reservoirs for storage of flood and waste waters of our streams.

(2) For building reservoirs for the storage of flood waters from the mesas and foothills.

(3) For exploration, in order to extend our artesian areas; and

(4) For developing the underflow.

ADVANTAGES. Soils.—The soils of the valleys of New Mexico are probably superior in productive capabilities to the alluvial soils of the prairie states. The secret of their great producing power probably lies in the large amount of sediment contained in the irrigation waters. The Nile Valley, with its irrigation waters loaded with sediment, is considered one of the most fertile valleys in the world, and yet in New Mexico we have a number of Nile valleys in miniature. It is no wonder that the visitor is surprised at the luxuriance of our vegetation.

Freedom from Insect Pests.—The crops of the Territory are not seriously troubled by either insect pests or fungous diseases. Much sunshine and a dry atmosphere prevent the growth of fungous diseases, and, therefore, these diseases are not likely to become troublesome in New Mexico. The insect pests that have found their way into the Territory seem to be quite easily controlled by proper treatment.

Two Crops.—It is quite a common custom, especially among the native population, to grow two crops on the same land in one season—that is, a crop of wheat and a crop of corn. This system would be inadvisable in the rain belt, but in sections where irrigation is employed and the water applied is loaded with rich sediment, it is a question if any serious criticism of this practice can be rendered.

Climate.—New Mexico's climate is a great source of wealth to her people. Agricultural operations, especially in the southern half, are carried on throughout the year. Ground may be plowed any time in the winter, and cereals and alfalfa are sown during this season of the year, thus leaving the summer growing months free in which to harvest the cereal crops and the four or five cuttings of alfalfa.

Horticulture

By FABIAN GARCIA

There are many thousands of acres in New Mexico, aside from those already in use, which can be utilized for horticultural purposes, provided water for irrigation purposes can be had. The portions of the Territory which are suited to horticulture are the river bottoms or valleys and the smaller valleys along the mountain streams. There are also large areas, commonly known as the "mesas" or uplands, which have the finest soil, and which would produce good crops if the water could be raised up to them. The largest horticultural districts are the Rio Grande Valley, extending from north of Bernalillo south to the Texas line, taking in portions of the counties of Sandoval, Bernalillo, Socorro, Sierra, and Dona Ana, the Pecos Valley, mostly in the counties of Chaves and Eddy, the Animas Valley, in San Juan County, and the Mimbres, in Grant and the counties of Otero, Lincoln, Luna, Santa Fe, Mora and San Miguel. The altitude of these different sections varies probably from 3,000 to 7,500 feet.

The soil varies from a sandy loam to a heavy clay. The soil, however, is ordinarily fertile enough to produce good crops if plenty of water is obtained for irrigation. The fertility of our soil is demonstrated by the rank and rapid growth of the trees and plants.

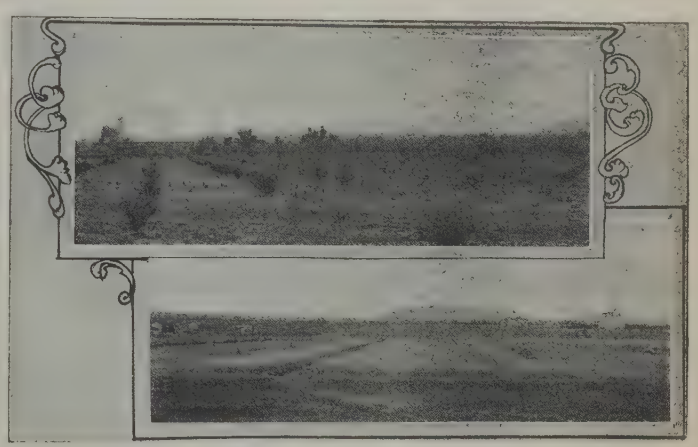
These climatic conditions throughout the Territory are, on the whole, favorable to the growth of fruits and vegetables. It is true, however, that owing to the great differences of climate, not all varieties of fruits or vegetables will thrive equally as well in all sections. This emphasizes the importance of the adaptability of plants to the different sections, which fact is being realized more and more by those intending to enter into horticultural work.

Since New Mexico lies in the arid zone the rainfall can not be depended upon for growing of fruits and vegetables. The rainfall is insufficient, especially in the larger valleys, for the development of crops. Occasionally, in the mountain districts, where the rainfall is more abundant and the humidity greater, some crops of fruits and vegetables are grown without irrigation, but one should not depend altogether on this. Irrigation is the only sure means of growing crops in New Mexico. By this means, other things being equal, the largest crops of excellent quality can be grown, and then, too, the danger of floods and droughts is largely mitigated. It is true that the irrigation of fruits and vegetables costs money, energy, and some skill, but the rewards are great and sure. With irrigation the crops need not suffer from either too much or too little water and the land can be made to produce abundantly every year.

In order to bring into play the favorable soil, water, and climatic conditions to the best advantage the adaptability of varieties of plants should be considered. It is not infrequently found that some varieties, although they may be among the leading ones in other states, are partially or entirely worthless in New Mexico, particularly of the stone fruits. On the other hand, some less valuable kinds in other states succeed admirably in many parts of the Territory. Such facts show the importance of planting the kinds best adapted to New Mexico conditions. In other words, the proper selection of varieties is an important factor in the success of the horticultural operations, and this is more and more realized by intending planters.

Fruit growing and vegetable growing are the two more important branches in horticulture in New Mexico. Fruit growing is the most developed and most remunerative. In some of the horticultural sections of the Territory it is assuming almost gigantic proportions, with practically no serious obstacle in the way of its becoming still greater provided proper precautions are taken to keep down any insect and fungus pests that may appear, as is done in other fruit-growing states. The horticultural sections are preeminently fruit growing, and the orchard fruits are equal to, if not superior, to those grown in other states.

Of all the fruits, the apple is the most extensively grown and the most profitable crop. Notwithstanding the topography of the Territory this fruit is well adapted to the different horticultural sections. The counties of San Juan and Santa Fe in the north, Bernalillo and Socorro in the central, Grant, Dona Ana, and Otero in the south, and Lincoln and Chaves in the southeast, are particularly known for their apples. New Mexico is now known not only in the United States, but abroad, for its fine apples. Its fruit is placed in competition with the world at the great expositions. In



Farm Scenes, Mesilla Valley

1901 at Buffalo the apples from New Mexico were conspicuous, and the fruit from Roswell, in Chaves County, received a first prize, while in 1900 the New Mexico apples were carried across the continent and the Atlantic Ocean to the Paris Exposition. There, New Mexico was counted in with the best apple-growing states of the Union, as specimen of apples from Dona Ana received second premium. This may give an idea as to the kind of fruit that can be grown in the Territory. Not only is the fruit of superior quality, but the crops produced by the trees are enormous; as a rule the trees tend to overbear.

The apple orchards vary from small family places to very large commercial plantations. The larger commercial orchards are located in the Mimbres Valley, the Mesilla Valley, and at Roswell. The Roswell district, which seems destined to become the largest apple-growing section in the Southwest, is particularly noted for its

large orchards. The largest bearing orchard is that of Mr. J. J. Hagerman, and comprises something over 500 acres. Aside from those already planted there are a number of very large orchards to be planted the coming winter. The most profitable varieties throughout the Territory are the winter apples, such as the Ben Davis, Gano, Missouri Pippin, Winesap, and Mammoth Black Twig. In a less degree the early varieties are also profitable; among the leading kinds may be mentioned the Early Harvest, Red June, Yellow Transparent, and the Maiden's Blush. The apple seems to be free from the common diseases and insect pests except the codling moth. This insect is beginning to be quite a serious pest in some of the apple-growing sections. The codling moth is a cosmopolitan insect, and where the apple is grown on a large scale it is almost sure to become troublesome, and after it appears in a locality it is impossible to eradicate it by any of the known remedies. However, its ravages can be very materially reduced by frequent sprayings.

Other pomaceous fruits, like the pear and quince, thrive as well as the apple, but these are not so important nor are they placed in such large areas as the apple. Only small plantations are found in the apple-growing sections. The pear has a marked adaptability, the trees usually bear early, are among the best drought resisters, and are long-lived and hardy. The fruit, especially of the large varieties like the Bartlett, Idaho, Beurre Easter, grow very large and are of fine quality. At present the pear is as free from diseases and insect pests as the apple. The dreaded pear blight, which is so bad in the East, has not threatened the pear industry. On the whole there is a bright future for more extensive planting of this fruit.

Pumping Plant—Agricultural College

The peach, which is grown with more or less success throughout the Territory, is perhaps second in importance at present. While peaches are grown in all the fruit-growing sections, the larger commercial orchards are generally found in the southern portion of New Mexico, and the largest of these are located in the Mesilla Valley and at Carlsbad. These districts are especially adapted to certain varieties of peaches which find their way into the Colorado and Kansas City markets. The early-ripening peaches, such as the Alexander, Sneed, Waterloo, Arkansas Traveler, and Hyne's Surprise, are among the most successful and sure bearers. This is due to the fact that as a rule the early varieties are the late bloomers, blooming late enough to escape the late spring frosts, which are so common in New Mexico and which oftentimes prove so fatal to the late-ripening kinds, such as the Elberta, Wonderful, Stump the World, Old Mixon Free, and others. The late-ripening peaches ordinarily bloom from eight to fifteen days earlier than the early kinds. The peach trees usually begin to bear at three years old from the time of planting. The tendency of the trees is to overbear, and it becomes necessary to thin them in order that the fruit may not be too crowded. The late varieties are only reasonably sure of bearing, and it is only occasionally that they have a full crop. In size and quality I believe the New Mexico peaches are not excelled by peaches from other peach-growing states. It is the common opinion of those who have tasted both the California and New Mexico peaches that the New Mexico peaches are the better in quality. The fruit is as a rule highly colored, due perhaps to the almost continuous sunshine during the ripening period. The peach is free from the serious diseases and insect pests and the worst drawback (and this is principally with the late kinds), is the late spring frosts. The trees, however, are ordinarily short-lived. Probably the profitable period of the peach tree in New Mexico is from ten to twelve years. By planting orchards at intervals of five to eight years a profitable orchard can be kept up almost indefinitely.

In New Mexico as in other places where the apricot grows, it has given evidence of a longevity greater than that of any other orchard tree, with the possible exception of the pear tree. It is not uncommon to see some very old seedling apricot trees growing in some of the Mexican home places in the Mesilla Valley, and it is claimed that at Santa Fe seedling apricot trees are known to be about 200 years old. The fruit from the improved kinds is as large and as good in quality as the California apricots, but the trees are not regular nor heavy bearers. Ordinarily the apricot crop is a light one and occasionally a total failure. The reason for this is that the trees bloom too early in the spring. A test conducted at the New Mexico Agricultural Experiment Station of a large number of varieties shows that all of them have that tendency. Out of twenty or more varieties none of them have as yet produced what is considered a commercial crop, although some of them have had light crops most of the years. As a commercial fruit the apricot in New Mexico may be considered to be of little or no importance at present, and from the data at hand it is believed its culture will not assume commercial proportions for reasons already given. None of the varieties tested can be recommended for extensive planting. However, the Blenheim, Moorpark, Royal, St. Ambroise, and Luizet are desirable for home planting. Cherries are only raised on a small scale. The trees of both the sour and sweet groups grow well. Varieties of the sour cherries are the best bearers, but the fruit, however, is not as large as that from the sweet varieties. Generally speaking, the sweet cherries, like the Bigarreaus, Duchess, and the Governor Wood, are of little or no value as bearers, for the reason that, as a rule, they bloom too early. The sour varieties predominate in New Mexico, as they have proven to be more regular and sure bearers. The Early Richmond, English Morello, Ostheim, and the Montmorency are among the leading varieties.

The plum, while not so generally planted as the apple, peach or pear, is making a place for itself in New Mexico. It has been but a comparatively short time since this fruit was considered to be of any importance, and even now the areas planted to it are very limited. However, conditions are changing, and there is a growing demand for it. The tree is perfectly hardy, although there is some variation as to the fruitfulness among the trees of the different types. The three types are, first, the European plum, which is the plum that gives rise to the old varieties, such as the Green Gage, Yellow Egg, Damson, and the various prunes; second, The Japanese plums, which are entirely different from the former type; and, third, the native type, such as the Wild Goose. As already stated, it is a well-established fact that the selection of varieties is an important consideration, and this is particularly true in regard to the plums in New Mexico. While the soils and climate are well suited to the tree growth, it is now thoroughly shown by the experience of fruit growers and by experiments at the New Mexico Agricultural Experiment Station that the Japanese plums are practically worthless throughout the Territory, owing to the liability to late frosts. On the other hand, the European plums do admirably. The trees are thrifty, heavy, and sure bearers. These plums are well adapted in every respect to the New Mexico conditions, and large and excellent quality of fruit can be produced. A few of the leading kinds of this group which have been tested at the experiment station are the Clayman, Jefferson, Imperial and Transparent Gage, Yellow Egg, Pond's Seedling, Washington, and the French and German prunes.

The native plums are also well adapted, but there seems to be a wider range as regards their blooming period; some varieties, like the Caddo Chief, bloom too early to escape the frosts; others, like the Wild Goose, Golden Beauty, and Pool's Pride, bloom late and are sure bearers.

Perhaps the grape occupies third place in New Mexico horticulture, and the Territory is also well known for its grapes. The European, or the so-called California, grapes succeed well, and these are the kinds grown for the market. The native or American grapes are not so satisfactory for commercial purposes, and are grown only for family use. The European grape has been cultivated for over a century, but its culture, generally speaking, has been confined to the southern and hotter valleys, and particularly to the

Rio Grande Valley from the Texas line to Santa Fe. The varieties that constitute the commercial vineyards are the Mission, Muscat of Alexandria, and more or less the Gros Colman and Flame Tokay. These grapes are shipped to the Texas, Louisiana, and Colorado markets, where they have given New Mexico a reputation for fine grapes. The Mission grape, while quite late in ripening, is the most popular and possesses excellent qualities as a table and wine grape, and is the grape of New Mexico at present. The Rio Grande Valley, and particularly the Mesilla Valley, is especially suited to the grape, and when its possibilities in this direction are more fully understood by the people this valley may yet become a vast grape-producing section.

The grape shipping season extends from about the 20th of August till the last of September. This short season is due to the commercial grapes being all mid-season varieties. Early and late ripening varieties need to be added to the large vineyards in order to extend the shipping period. In view of this need, the experiment station has started a test of a large number of varieties, and already some valuable data are being gotten in regard to the early foreign grapes, which ripen about two weeks earlier than the mission. Some of these new grapes are the Muscat, Precoco du Puy de Dome, Thompson Seedless, and some of the Chasselas group.

New Mexico produces vegetables as well as fruit, and whenever water for irrigation can be had many vegetables do well. While truck gardening is not carried on very extensively, due perhaps to the great distance to the large markets and to the high freight rates, it is nevertheless increasing every year. Some of the horticultural sections are especially suited to certain vegetables. A few of the more important vegetables are here mentioned.

Celery can be grown excellently in those parts of the Territory where the soil and climatic conditions are favorable and where some skill in growing it is exercised. Among the best known celery-growing sections are those in the mountains, around Albuquerque, and at Roswell. The latter place is probably the most noted for its celery. It produces a large quantity, but not enough to supply the demand. It is claimed that the Roswell celery is equal if not superior to the product from California and Louisiana, and will sell equally as well in the markets outside of the Territory.

Fine Rockyford cantaloupes can be raised in New Mexico. Cantaloupe growing is getting to be quite a business in the southern portion of the Territory. Some are grown at Las Cruces for the early market, which are shipped mostly to the local markets in the Territory, but the large areas are found at Carlsbad and Roswell. From these places car loads of cantaloupes are sent to the eastern markets. It seems that there is no material difference between the New Mexico and the Colorado Rockyford cantaloupes. New Mexico, however, has the advantage over Rockyford inasmuch as the cantaloupes may be placed on the market earlier.

The tomato grows well and is quite an important crop in New Mexico. While it is grown in all the horticultural sections, the largest fields are in the Mesilla Valley. A canning factory is established at Las Cruces which cans a large quantity of excellent tomatoes. The canned tomatoes are sold in New Mexico, Texas, Arizona, Colorado and other states. The demand for these tomatoes is greater than the supply. This canned product has also added to the reputation of the Territory.

New Mexico is also known for its onions. While at present the area planted to onions is very limited, only about 160 acres, and the production insufficient to supply even one-tenth part of the home consumption, there seems to be a bright future for it, and the chances are that it will become a crop of great commercial value to the Territory. Large and fine quality onions can be grown throughout New Mexico. Probably the Rio Grande Valley is the largest onion-growing section, and here is where the old "El Paso" onion, which has given New Mexico a reputation as an onion-growing country, grows so well. It is not infrequent to see specimens weighing 1½ pounds. The yield per acre is as large as in other states, although the United States census report for 1900 gives a very low average of about 9,000 pounds. The results at the experiment station show that such varieties as the Red Victoria will produce 32,000 pounds per acre.

The branch of horticulture that is less developed in New Mexico is that of floriculture, but even here marked and rapid strides are being made, particularly in home adornment. Many of the flowering plants, like the rose, violet, chrysanthemum, and sweet peas, do well in New Mexico.

While horticulture is one of the leading interests in New Mexico, and people of all classes are more or less interested in some branch of it, the possibilities of the Territory in this direction are not fully realized. Only a small part of the land that is adapted to horticulture has been used. In recent years there seems to be more interest taken in horticulture, and no doubt marked improvement will soon take place in this line.

Cutting Alfalfa in New Mexico

The Development of New Mexico

By H. B. HENING, Secretary New Mexico Bureau of Immigration.

THE WEALTH of romantic and picturesue incident and adventure surrounding the earlier chapters of the history of New Mexico must always be fascinating and entertaining. These earlier chapters have already been widely exploited by numbers of graceful writers and the writings concerning them furnished until quite recently the sum total of the knowledge of this Territory possessed by the general reading public of the United States. But the history likely to be of enduring interest to the practical American mind is found in the period of solid material advancement, in the broad sweep of industrial development which began simultaneously with the beginning of construction of government irrigation projects here and with the discovery by a large number of enterprising Americans that the Territory's 122,000 square miles contained something more than a few fertile river valleys surrounded by unlimited range for sheep and cattle. The recording of this period of our history began about five years ago. Up to that time the impression of New Mexico carried in the minds of a vast majority of the people of the United States was of a land of vast and sand-swept prairies; of rugged, half-explored mountains; a land chiefly useful as a roadbed for railroads leading to more favored lands to east and west and to have been avoided had avoidance been possible. Through the medium of the graceful and prolific and usually inaccurate writers referred to above something of our history had become known, chiefly to our disadvantage; for it was for the most part composed of snatches of frontier incident, tales of bad Indians and worse white men, scraps of information about archaeological treasures to be found in remote places. Something had been written of the journey of Coronado the great Conquistador and of the golden cities of Cibolla which he sought; fragments of the splendid story of the intrepid Mission Fathers, the first white farmers of America. These same writers told occasionally some thrilling incident of the period of Mexican dominion, of the American occupation, of Indian wars, the Texas invasion and the bloody and heroic story of the conquering of the Apaches. But chiefly the writings were of border outlaws, poor figures of men for the most part made interesting by the unrestricted play of imagination; thrilling stories of deaths on the desert, of lynchings and range wars. Some of the stories were true; most of them were not, but for a quarter of a century they were about all the reading public of the Nation was allowed to have in the way of information about New Mexico until it became the fixed impression that this was a land of red-girdled Spaniards, of picturesque Indians and of fire-eating bad men; a land of desert, barren hillsides and untold hardships.

Elephant Butte Dam Site

So it came about that it was not until the Government began its mighty work of reclamation and found in New Mexico fair opportunity for many of its greatest projects; it was not until the great southwestern railroad systems found that New Mexico lands, irrigated and non-irrigated, New Mexico mines and New Mexico forests might be profitably exploited; it was not until the hordes of land hungry homeseekers discovered for themselves that New Mexico was not a desert but a land of deep, rich soil that the truth about this land was spread abroad. So firmly fixed had become that popular impression of New Mexico the picturesque and worthless, that New Mexicans themselves had begun to accept it as true and it required the stimulus of a vigorous government policy and the knocking of an army of homeseekers at our doors to awaken us to the possibilities of our own land.

The awakening, at first partial and local, became complete and general five years ago. Since that time New Mexico's industrial development has been moving forward by leaps and bounds until today there is no man so blind as not to see the brilliant promise of the future. Cities and towns are growing, railroads are reaching out in all directions, new industries are being established, the forests and mines are being exploited and last and most important of all the possibilities of the land are being discovered and made known; for it is in agriculture that this recent development has been most remarkable and it is to the land that New Mexico must look for her greatest development in the future.

Nothing tells more convincingly the story of the new period of progress than the increase in New Mexico's population. The constant and up to this time the unanswerable argument against the admission of this Territory into the Union has been the scant population of her vast area. It is an argument no longer. In 1900 the census gave this Territory a population of 195,000. Inaccurate as that census undoubtedly was it erred as often in overestimating as in underestimating and the total given at that time was probably nearly true.

Leasburg Dam

The population of New Mexico today, carefully and conservatively estimated from election returns, from school census, from post office and land office records and from every other reliable basis of estimate we have, is 450,000. The end of 1909 will see it well past half a million.

During the period from 1900 to 1903 there was comparatively little increase in population. The eastern portion of the Territory, although railroads were then under construction, remained practically unopened and unknown, while the established railroad systems entering the Territory had made no effort to direct immigration here, being still engaged with the development of better known regions and laboring under the impression that New Mexico had nothing with which to support an increased population.

In 1903 a small band of hardy farmers discovered what had been known to the Indians and to the Mexicans for something more than a century, that there were portions of New Mexico's great area on which crops might be successfully grown without irrigation and depending only on the rainfall. This discovery was made at

Concrete Aqueduct, Carlsbad Project

what is now Portales, in Roosevelt County, a county which has advanced in population from 1,000 to 30,000 in four years. Good crops were being grown in this district about the time the first experiments were being made with the so-called dry or scientific farming in Colorado and Western Kansas. About the same time farmers began to come into the region around Texico, along the Texas border and the opening of a new line of railroad through the northeastern portion of the Territory was immediately followed by the establishment of farming communities in that section. These farmers, after their first successful season, wrote to their friends in the more crowded districts and before the railroads realized what was happening, or the reason for it, homeseekers began to pour into the Territory, from all sections. The United States land offices were flooded with applications to file on land up to that time considered of value only as range for sheep and cattle and the volume of business increased so rapidly that application had to be made for increased clerical forces. The rush of homeseekers to the co-called dry-farming districts gained headway gradually during 1904 and 1905 and gained its climax during the period from June, 1906 to June, 1907. The records of the four United States land offices in New Mexico for the fiscal year, June 30, 1906 to June 30, 1907, show a total of 23,000 homestead entries covering an area of more than two and one-half million acres. During the same period about 1,200 desert land entries were made.

While showing some dimunition during the fiscal year from June 30, 1907, to June 30, 1908, the rush of homeseekers continued gratifyingly large, for during that period the records of the four offices show a total of 15,632 homestead entries, covering an area of 2,431,000 acres while 895 desert land entries were made. Of these entries more than 8,000 were made in the Clayton land office covering northeastern New Mexico, 3,200 in the Roswell land office covering southeastern New Mexico, about 3,000 in the Santa Fe land office covering central and northwestern New Mexico and about 1,200 in the land office at Las Cruces covering the southwest. So great became the rush at the Clayton office that it became necessary in the spring of 1908 to establish a fifth land office at Tucumcari. We find then, in the two years, a total of approximately 40,000 homestead entries covering an area of more than 5,000,000 acres. Practically all of these entries were made on the so-called dry farming land, since practically every acre of irrigable land in New Mexico has long been in private ownership. A careful analysis of the land office records establishes the fact that more than three-fourths of these entries were made by people from other states and territories. Upon the conservative basis that 30,000 of these entries were made by immigrants it is safe to estimate that the records of the land offices alone show an increase of 100,000 in population in the two years.

Up to this time the development and success of the dry-farming regions is the most powerful force in the Territory's forward movement. It is a development, although now but in its infancy, that has come to stay. It has already added a million acres to New Mexico's cultivated area and it will double that increase within two years, for most of the farmers who have entered the dry-farming districts are new to the business and must accustom themselves to changed conditions and new methods of cultivation. They are, for the most part contenting themselves with the cultivation of forty acres or less. They have not had time as yet to settle down to the full cultivation of their land. Breaking sod land is not child's play and there have been homes and barns to build. These farmers are moving forward cautiously, trying out the crops most likely to give best returns and learning how to get the best results from the new system. For evidence that the system is successfully established it is only necessary to study the growing season of 1908. This was a season of unusual drought. From late April until the end of June practically no rain fell, and many of the people became discouraged. But they had planted deep and had followed as closely as they could the peculiar methods of soil preparation demanded by the new system. The rains which although delayed, came bountifully in the early days of July brought the crops through successfully in almost every district.

With thousands of newcomers, many of them with homes scarcely established, it was to have been expected that under these conditions there would have been a wholesale abandoning of claims. But no such thing occurred. The number of claims abandoned during this trying period was actually smaller than for the same period of the successful preceding year. After this experience it

Carlsbad Project, Main Canal

seems safe to conclude that the success of dry farming has been established in practically every district where it has been attempted and the success of this new farming is alone sufficient to establish New Mexico as an agricultural state and to place stock growing, (up to a few years ago New Mexico's greatest industry), in second place. The coming of the homeseeker has checked any further advance in the range live stock industry. The grade of flocks and herds will im-

prove but the number will decrease, for the better portion of the open range is being turned into farms and everywhere fences are cutting the broad sweep of the short grass country. The Estancia valley of Central New Mexico is a fair illustration of what has been accomplished by the invading army. This valley lies along the Santa Fe Central Railway from Kennedy on the Atchison's main line to Willard on the Santa Fe cut-off. Four years ago it was open range, pasturing thousands of head of sheep. Today a band of sheep cannot get within ten miles of Estancia, the central town of the valley, without becoming entangled in fences, or invading farms. The whole valley within easy driving distance of the railroad has been taken up and a permanently established farming community has appeared. The same transformation has taken place along the Rock Island railroad from the northeast border of the Territory to the southern boundary of Guadalupe County and the same transformation is now taking place all along the three hundred miles of the Santa Fe's new east and west line from Albuquerque to the Texas border. Along this line, completed less than a year ago and opened to regular traffic on July 1, 1908, a dozen prosperous towns have sprung up, each one surrounded by its farming community. Farming without irrigation has also been found profitable on the high mesa lands near Las Vegas and along the Santa Fe in northern New Mexico and it is but a question of time until it is expanded into practically all sections of the higher altitudes.

Gate of Reservoir, Hondo Project, N. M.

The census of 1900 showed New Mexico to have less than 500,000 acres of land under cultivation. Today there are not less than 2,000,000 acres of agricultural land of proven value and the next two years will add another million to this. These are not random figures; but the result of careful summarizing of the acreage now being brought under cultivation by dry farming and by the numerous irrigation projects, national and private, great and small, in course of construction all over New Mexico. Dry farming has been responsible for the greatest part of the recent increase in population and it has been of especial value in encouraging the railroads to the exploitation of regions which could not otherwise have been brought to public attention.

Dry farming has been important in our development up to this time and will continue so. But the great force for development, for increase in population and wealth will be irrigation. The irrigated districts have not been idle during these past five years. They have been pushing forward steadily and within the next few years will become the chief factor in the forward movement. Although this Territory and particularly the Rio Grande Valley has just claim to the title "Cradle of Irrigation in America", modern irrigation is in its infancy here and the possibilities of the irrigated districts are but little known. The history of irrigation as discovered by Coronado and as carried on by the Mission Fathers and the descendants of the first Spanish settlers is well known. There has been little improvement in the system of a century ago, up to the last few years and it is only since the Government came into the field that the modern irrigation system has begun to take hold. Attempts had been made at private enterprises on a large scale, but they had, for the most part, been failures and there had been little real forward movement until the Government determined to proceed with the three great relcamation projects, the Carlsbad, the Hondo and the Elephant Butte, or Engle storage reservoir. The simple announcement that the government had approved and determined to build these projects in New Mexico at once directed national attention to the irrigated lands of the Territory and the access of interest in these lands among farmers and capitalists was instant. The result has been an immediate demand for irrigated and irrigable land and a widespread development which within the next two years will result in the reclamation of many thousands of acres aside from the area reclaimed by the government projects. The rebuilding of the Carlsbad project by the government has insured the future of that district; a future which up to the time the government assumed control, was seriously threatened. The building of the Hondo reservoir near Roswell has done more to attract attention to the fertile Pecos valley than even the splendid system of artesian wells that has been developed there. The construction of the Leasburg Diverting dam near Las Cruces has given stability to farming in the Mesilla Valley and insures prosperity pending the completion of the great Engle project and the vast extension of the irrigated area of the lower Rio Grande Valley which will follow. These have been the first direct results of the work of the Reclamation Service. There has been an even greater indirect benefit which has not been

Raised Without Irrigation, Near Las Vegas, N. M.

confined to any locality, but which has reached every section of the Territory. The wide publicity given the government projects attracted and is constantly attracting attention to New Mexico irrigated lands. Individual farmers are coming here to buy farms and small tracts. Capitalists and corporations are taking hold of irrigated lands or tracts that can be reclaimed. The result of the purchase of small farms by individual farmers is an immediate improvement in the community ditch system, for every new farmer makes the old system more a burden and brings modern methods closer. The purchase of large tracts by capitalists and corporations means usually the development and reclamation of new areas. Actual construction is now under way on seven large irrigation projects in New Mexico by private capital. Large enterprises are under way in northwestern Valencia county, at Bluewater, in the Central Rio Grande Valley at Los Lunas, on the Rio Puerco in Valencia County, in Socorro and Luna counties, in Colfax and San Juan counties. A corporation is now preparing to reclaim fifty thousand acres within the great Maxwell Land Grant, while the projects under consideration in San Juan County will reclaim 200,000 acres. In addition to these larger projects smaller ones are to be found in practically every county in the Territory.

Harvest Scene Near Las Vegas, N. M.

There is a limit to the productivity of the dry-farming lands. Only a limited number of crops will produce successfully and the yield is naturally governed to a certain extent by the average rainfall. But to the yield of the irrigated lands of New Mexico there is no limit. Planted to field crops, to truck or to orchards the crops are enormous and the profits surprising. It is therefore to the irrigated land that New Mexico must look for the greatest production of wealth and while the development of these lands is slower, a definite period of development has set in over the entire Territory, the results of which will be immediate and so great as to insure in the near future the development of every acre of irrigable land in the Territory. Already capital is seeking out the numerous areas of fine land within the land grants; is looking over available tracts along the waterways and there is scarce a stream within New Mexico which is not being considered for use in an irrigation project. The area of irrigable land is limited, but it is still great enough to support twenty times the present population of the Territory and not one-twentieth of it is now under cultivation. The speedy reclamation of this land, most of which must be by private capital, will give New Mexico a tremendous growth in both wealth and population.

While the greatest development of the new period has been in agriculture and while agriculture is destined to continue New Mexico's greatest resource, it should not be concluded that the Territory's progress has been confined to the soil. The development of the mining industry has been slow. It has been subjected to the same retarding influences which have delayed the development of the land—mistaken impressions created by irresponsible writers and inaccurate historians, lack

San Juan County Exhibit at Colorado State Fair, Oct., 1907. Awarded Blue Ribbon and Red Ribbon and Sweepstake Prizes

of knowledge and lack of adequate transportation. To these the mining industry has had to bear the added disadvantage that, requiring large capital for profitable development, it has been held back by the territorial form of government for it has been found that capital is slow to come into a district where conditions in government are uncertain, unless the rewards are certain and very large. New Mexico also has suffered from numerous floatations of unworthy properties and has had to bear more than her share of wildcat mining schemes. But even these disadvantages will be and are now being overcome. Within the past few years values have been established in several of the principal mining districts, notably in Grant and Socorro counties, in Lincoln and Dona Ana and in other less known sections. Great ore bodies have been blocked out and many thousands of dollars have been expended in development and equipment. The period of depression which has made itself felt in every mining district in the West has, of course, had its effect in New Mexico and many development projects and not a few established properties have been idle as a result. But the values are known and it is but a question of time until the great copper bodies, and the known producers of gold and silver, and more important perhaps, the vast bodies of lead and zinc will be finding their way to market. Within the past two years the attention of several of the foremost mining experts in the Nation has been drawn to New Mexico and their reports have indicated that this Territory has a future as a producer of gold and silver, copper, lead and zinc that will make it the equal of Colorado or Arizona.

New Mexico's greatest underground resource, however, is in coal. And it has been chiefly in the coal mines that the mining industry has found advancement. Within the past two years the output from the great coal beds of Colfax County has more than doubled. Several of the greatest coal camps in the West are now in that county and there is coal enough in sight to supply the whole southwest for an indefinite period. Large coal properties are in operation at Gallup in McKinley County, in Santa Fe County and in Socorro County. The extensive coal bodies of San Juan and Valencia counties are as yet untouched. They form not the least of the Territory's future resources.

The forests have come in for their share of the general development. During the past four years the lumber industry has grown to enormous proportions and several large mills, of which the American Lumber Company's plant at Albuquerque is the pioneer and the greatest, are in operation. New Mexico has millions of feet of mature, merchantable timber of the finest grade waiting to be cut. Much of it is within national forests; more still in land grants. During the summer of 1908 the first great drive of logs and ties was made down the Rio Grande from far up in Rio Arriba County, one of the most extraordinary feats in lumbering ever performed, for it was necessary to depend entirely on floodwater to make the drive. Generally speaking, the forests of New Mexico require railroads for profitable development, but even the heavy expense involved in railroad construction is overcome by the large profits, and development is proceeding rapidly.

To go at length into the many lines of less important development would be impossible. It is enough to say that the industrial development of the Territory is moving forward, step by step, with the advance in population. New Mexico has waited long for the period now opening before her. The Territory has been held back by the territorial form of government; her growth has been retarded by the direction of immigration and capital into other fields; she has been injured by that insidious force, unfortnate publicity; and a mistaken idea as to the character of the people on the one hand and an utter lack of knowledge of the enormous natural resources on the other.

Cotton Growing Near Carlsbad

Now, however, intelligent publicity has overcome the mistaken impressions created by years of irresponsible writing and the exploitation of the picturesque but unprofitable features of the region. The railroads have discovered that New Mexico affords a field for exploitation and development fully as profitable as any other western state; they have come to realize that they have overlooked this field in the past and are doing their best to remedy the error.

And finally the Territory has the pledge of both great political parties that it shall be admitted to the Union at the coming session of Congress, now near at hand. The pledge has often been made before and as often broken. But this time it is made, apparently with complete sincerity so that we have reason to hope that presently our last and most serious handicap to unrestricted development will have been removed. If this be done, such an era of progress will open in New Mexico as has not been dreamed of before.

The Economical Use of Water in Irrigation Farming

By CHARLES SPRINGER

ABOUT one-third of the total area of the United States proper, lies west of the 100th Meridian of longitude and with the exception of parts of Oregon, Washington and Northern California and in the higher mountain valleys, the land in this vast area of over one million square miles does not receive sufficient rainfall to produce crops by ordinary methods of farming.

While it is true that in many places good crops are being grown by the Campbell sytem of dry farming, the farmers of this entire region must ultimately depend chiefly upon irrigation.

Contrary to first appearances, nature has in fact provided bountifully for these people. To compensate for shortage of rainfall, the soil, probably because of that shortage, possesses wonderful fertility and, under irrigation, is practically inexhaustible. In the many mountain ranges the precipitation as snow and rain is excessive, and most of it runs to waste in floods down the water courses. These flood waters, if stored in artificial reservoirs and added to the normal flow of the streams and the natural rainfall on the farms, are sufficient, if economically used, to produce abundant crops on most of the prairie and valley lands.

By private enterprise and by the large storage dams being constructed and projected by the United States Government under the Reclamation Act, these flood waters will in time be impounded and utilized.

Land under irrigation is capable of supporting an immense population. Each square mile of irrigated land in the Po Valley in Italy, furnishes a living for 300 people, and the irrigated land in the Valley of the Nile supports 543 persons to each square mile.

The economical use of water thus becomes a problem of vital importance. Its successful solution means the difference between failure and success for the farmers and will do much to promote the prosperity and happiness of all the many millions of people who may inhabit the semi-arid region. And it will mean much to the Nation and to the world in time to come.

As the human race made its first start in the semi-arid regions to escape the fevers and wild animals of the forests and jungles of humid countries, so it may come to depend largely upon the inexhaustible fertility of the soil of such regions and the certainty of crops under irrigation, for its food supply.

WASTEFUL METHODS NOW IN USE. The principal causes of waste and loss are:

Excessive evaporation, on account of too frequent irrigation by flooding systems and *lack of cultivation.*

Uneven surface of fields, requiring too much water, time and labor, trying to irrigate the high places.

Allowing water to run for days at a time on meadows, alfalfa fields and waste lands instead of turning it back into the stream or canal.

Most farmers apply water to their crops too often, usually shallow irrigations by flooding, and only cultivate for the purpose of killing weeds. They allow the surface to bake and crack instead of keeping it finely pulverized. One deep irrigation followed by cultivation will do more good, with much less water and labor than half a dozen shallow waterings without cultivation.

Water standing in low places, or flooding too long over one place, particularly in hot weather, will scald and sometimes kill the plants and will often cause much injury to the soil. The soil will become "water killed" and with some fine rich soils this injury is not easily cured. Its productiveness may be seriously impaired so that much cultivation, the action of rain and frost, and either manuring or plowing under a soiling crop, may be necessary to restore its fertility. Sometimes large areas of lower lying lands are ruined by excessive irrigation and allowing water to run to waste on higher lands, and it requires expensive drainage works to reclaim them.

Another cause of serious loss and waste is seepage through gravel, loose shales and porous places in the bottoms and banks of ditches. Such places should be patched with cement, or wooden flumes, or the porous material scraped out and replaced with good adobe dirt.

In California, where water is more prized than anywhere in the world, cement lined ditches, cement pipes, concrete flumes and ditches, and wooden and iron pipe, are used to prevent seepage and evaporation. Water users there are stimulated to adopt these and other measures of economy by the scarcity and high price of water which is usually sold by the miners inch. The result is that the duty on water has been so increased that one miners inch flowing constantly during the irrigating season now serves to irrigate from five to ten acres, whereas, under the methods formerly in use there and now in use in New Mexico, Colorado and other places, it would only irrigate one or two acres.

SELLING WATER BY THE ACRE FOOT. The prevalent custom of selling water rights and annual maintenance charge, is believed to be largely responsible for the careless and wasteful methods now employed, and it is questionable whether any very great improvement can be expected so long as the farmer has to pay the same price regardless of the quantity of water he uses.

Whether the charge is based upon the number of shares in the ditch or reservoir system, or upon an indefinite water supply for a certain number of acres, and even where it is based upon furnishing a definite number of cubic feet per second or miners inches running constantly during the irrigating season for a limited number of acres of land, the farmer is tempted to try to use or waste all the water he can get from his ditch right.

Water might be sold by quantity so the farmer would pay for only what he used. He would then have a constant reminder to use as little as his crops required, and to resort to cultivation, to better methods of irrigation and to the selection of crops and varieties which would give the largest return for the quantity of water used.

The acre foot, equal to 43,560 cubic feet, seems to be a most convenient standard of measurement for the sale of water, and is particularly adapted to irrigation systems having storage reservoirs.

The price of a permanent water right would probably, as now, be a certain sum per acre, based on the cost of the works and the enhanced value of the land on account of its right to be supplied with water; but the annual charge under private and government systems, and community ditches, ought to be based on, and proportioned to, the quantity of water used by each farmer.

Contracts might provide that the farmer should take and pay for a certain minimum number of acre feet per annum under his water right, at a definite price per acre foot, and that he should receive credit for any shortage or failure of the Company to deliver water, on account of drought, bad management or other cause. The loss of crops from drought is enough for the farmer to bear and the loss of water should fall on the owner of the works, instead of making the farmer bear all the loss as is often the case under present methods.

There should be some arrangement whereby the contracts could be re-adjusted every few years in case the farmers found they could properly irrigate their lands with a less quantity of water, and the surplus water should then be applied to new land. It is to be hoped that this question will receive the careful consideration of government irrigation officials and owners of irrigation works, and that some equitable plan may be generally adopted to the end that the public waters may be made to serve the greatest possible amount of land.

PREPARING THE LAND FOR IRRIGATION. The secret of success in irrigation lies chiefly in the proper laying off and construction of ditches and head gates; the adoption of a system of applying water suitable to the character of the soil, the kinds of crops to be grown and the amount of water available; and in *grading, leveling and smoothing the surface before planting.*

Whatever system is adopted the leveling and smoothing is of the utmost importance and no matter what the cost, it will be returned many fold in years to come in saving of water and labor, and increased yield of all crops.

It will well repay every farmer to study the different kinds of levelers in use and buy or make one to meet his requirements. It is much more profitable to farm ten acres which has been properly prepared than several times that amount of rough, uneven land.

The ditches should be carefully surveyed and staked out by an engineer and the farmer should first determine which of the several systems is best suited to his soil and circumstances.

THE FURROW SYSTEM. For all crops planted in rows far enough apart to be cultivated, and especially for orchards, potatoes, sugar-beets and other crops which do not thrive by flooding, the furrow system is undoubtedly the most effective, the safest and the most profitable, and its general adoption, wherever practicable, will do much to promote economy in using water and the success of irrigation farming.

The farm should be laid off in fields of proper size and slope by a competent engineer. The head ditches or flumes across the upper ends of the fields or lands, from which the water is taken for the furrows, should be conveniently located, and supplied with boxes and gates, and should be on a light grade. These head ditches are to be supplied with water from the main laterals.

If the soil has not been previously broken and loosened up for a considerable depth, it should be plowed as deeply as possible, when moist from rain or irrigation and a good subsoil plow used. Then the surface should be made smooth and even with a good grader or leveler and scrapers where necessary. The line for the first furrow should be laid off on a uniform grade, following the contour of the surface, so the water turned in at the upper end of the furrow will run through to the lower end without overflowing and without scouring or cutting the bottom or sides of the furrow. The length and grade of the furrow should be determined by the character of the soil—shorter and steeper for porous soils and longer and with less fall for soils which absorb water more slowly. The ground should be planted in rows parallel to the first furrow line, which can be done by using a guide marker such as is used with a corn planter. If the ground has been thoroughly and deeply irrigated, and the planting properly done, the crop will come up and get a good start so the ground can be cultivated several times before irrigation becomes necessary. The irrigating furrows may be made along-side the plant rows by irrigating shovels attached to cultivators or with a small plow or with a machine specially designed for furrownig. *The deeper the furrows, the better.* A few deep furrows will do the work better with fewer gates, less labor and less water, than many shallow ones.

A subsoil cutter run, at proper intervals, across the land before the furrows are laid off, or before planting run at right angles to the course of the furrows, will greatly facilitate irrigation from furrows. This implement, described elsewhere in this article, does not turn over the soil but its sharp edge makes small vertical cuts through the hardpan and the wedge shaped foot loosens up the ground and leaves small channels in the subsoil to receive the water.

There are many different ways of letting water into the furrows. Concrete head flumes, with spouts or gates, for filling the furrows, are probably cheapest in the long run, but flumes of wood, or galvanized iron, either stationary or in movable sections which fit into each other, with small spouts or gates opposite the furrows, are more convenient.

Wooden spouts, or sections of pipe or tile, may be set in the side of the head ditch or of a small distributing ditch. These wooden spouts may be made by nailing together four narrow strips of board. Each spout or box should have a small slide to regulate the flow.*

Some farmers use dams of dirt and weeds or straw to divide the water between the furrows, but this is a poor method and requires much work and great skill. With very porous soils a good head of water should be turned into the furrow at first so it will run through quickly, and then the flow should be regulated so the water will just run through to the lower end; but with fine, compact soil the water should be turned in slowly at first and gradually increased till it will just run through to the end of the furrow. When a furrow full of water is run through such soil rapidly it will "slick" the sides and bottoms of the furrows so the water will not soak in so freely. A slow, steady rain where the water goes into the ground under light pressure will soak much deeper than a much larger quantity coming in dashing showers. The same principle should govern irrigation.

This system is being used in some places to irrigate small grain and alfalfa, which are planted in drill rows on uniform grade and the furrows are made with a furrower or marker which makes about eight furrows at a time, one furrow for each row of grain or alfalfa.

Briefly stated, some of the chief advantages of the furrow system are:

Water does not come in direct contact with the plants, but soaks through the sides of the furrows and may be allowed to run until the soil around and under the plants is moistened to any desired depth, without danger of scalding the plants or of causing the surface to bake and crack, as under flooding systems.

The "lands" may be larger and the farm will not be cut up by so many ditches and borders, as with check or flooding systems.

It is adaptable to more different crops, to more different kinds of soil and to more varied conditions, than any other system.

Rough, hilly land, that could not be successfully irrigated in any other way, may be irrigated through furrows following the contour of the hill on proper grade.

It permits the use of small streams of water from springs or wells, which would accomplish very little by flooding.

It requires less grading and leveling than other systems.

It requires much less skill and experience to properly irrigate crops by furrows than by flooding. After the head ditches and flumes are located any one can turn the water into the furrows and there is little danger of over irrigating.

It is the only practicable method by which water can be put into all kinds of soil deeply without danger of injury to the plants or soil. Frequent flooding causes a "hard-pan" to form a few inches below the surface which is avoided by irrigating through deep furrows.

The luxuriant growth of plants along ditch banks is everywhere noticeable. With the furrow system every plant is on a ditch bank.

The saving of labor of grading, saving of labor and water in irrigating, saving of time and broken machinery in harvesting by having fewer ditches and borders to cross, and the increased yield of all crops over any system of flooding, will pay for flumes and appliances for letting water into the furrows, and will pay for the farm in a few years.

FLOODING BETWEEN FIELD DITCHES. With firm loams and generally uniform surface and slope such as most of the valley and bench lands in Colfax County, New Mexico, where the supply of water is abundant, and particularly if alfalfa is the main crop, the system of flooding over long, narrow lands, while not so economical in the use of water, has many advantages; and if the lands be carefully graded and leveled, it is the cheapest system of flooding.

The farm is divided into long, narrow lands, having a ditch with good borders on each side and with head ditches across the upper ends. The lands and ditches may be straight, or on contour lines if the slope is uneven. They should be from three to eight rods wide according to the slope and the amount of water available, and may be as long as the nature of the ground will permit. The lands should be laid off so they will be as level as possible on a line at right angles to the side borders, and of a continuous grade lengthwise of the land but not so steep as to cause scouring or cutting of channels when irrigating. The ground should be plowed as deeply as possible with a strong grading plow when moist from rain or irrigation, and should be carefully graded to a level crosswise of the land, and the surface smoothed with a good leveler so that water will spread evenly from one ditch border to the other and flow uniformly down the land to the lower end.

If the lands are very long, the water can be turned in at proper intervals from the side ditches.

By having boxes and gates properly arranged the irrigating can be done at night, as well as in day time, and advantage can be taken of flood waters from dashing rains.

The mistake is often made of having the lands too wide for the amount of water used. Much better results are obtained with narrower lands and they require less grading.

The method used in some places, of flooding across the lands

*For particular description of flumes and appliances see Bulletin No. 145 United States office of Experiment Stations, which can be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C.

without leveling is an expensive and wasteful method and causes the crop to ripen unevenly in streaks.

THE CHECK SYSTEM. For loose, sandy soil such as much of that in the Rio Grande Valley, in New Mexico, the check system of flooding is much used.

The farm is divided into small sections with borders on all sides and the surface graded to a level both ways. These divisions may be square, oblong, or on contour lines, and one distributing ditch with good borders and gates may serve two rows of checks. The tendency in new districts is to make the checks too large, requiring too much grading to get the surface level so the water will spread evenly over the land. The best size is usually about one acre or less to each check.

Boxes or gates should be used to let water into the checks from distributing ditches and from one check into another, and so the gates can be set to irrigate at night and to catch flood waters.

THE BASIN SYSTEM. A modification of the check system, called the basin system, is used chiefly in orchards. Borders are made with a plow, making squares round the trees large enough so the water will extend out to the ends of the roots. The borders are high enough so that when the basin is filled the water will back into the distributing ditch. It is a good system for irrigating young orchards and prevents damage to the trees from gophers and burrowing animals. For old orchards, for berries and for gardens, the furrow system is much more effective, and the writer believes that the furrow system will eventually replace both check and basin systems for all kinds of soil and crops.

SPRINKLING, SUB-IRRIGATION AND OTHER METHODS. Sprinkling from pipes and hose is a good method for lawns, but the frequent application of water in small quantities, to the surface, in a dry country where evaporation is rapid, causes the soil to pack hard and causes the roots of plants to grow near the surface. If sprinkling is used the better way is to allow the sprinkler to run for a long time in one place until the soil is wet six inches or more in depth, and sprinkling once in three or four days instead of daily.

Sub-irrigation by means of underground pipes and tiles is too expensive and has not given as good yield as the furrow system.

On some sloping land underlaid with gravel or very porous material resting on clay, sub-irrigation from parallel ditches has proven very successful, but it is not often that conditions are just right for this method.

Large pipes and canvas hose are sometimes used for flooding or furrow irrigation, instead of ditches and flumes and with good success, especially on uneven ground.

PREPARING THE SEED BED AND PLANTING. The lands, ditches and headgates being properly arranged, the preparation of the soil and planting require much more careful attention than is usually given to them, in order to secure a good stand. It takes about the same amount of water and labor to irrigate, cultivate and harvest a poor stand as a good one. The land is usually rich and the water valuable; so the object should be to make the water and labor serve as many plants as the soil will support. Whatever crop is to be planted, the seed should be carefully tested before-hand by planting samples of it in boxes in the house. Small grain should be thoroughly cleaned and sorted with a fanning mill, so it will be of uniform size and feed evenly through the drill.

Unless the ground has been plowed, harrowed and leveled in the fall or winter, it should be irrigated a few days before planting time and when the top soil has dried out sufficiently so it will break up mellow and can be finely pulverized, it should be plowed with a good sharp plow so that every furrow will be laid evenly and so as to leave no dead furrows or ridges. If the soil is very compact, or if there is a hard-pan within eight to ten inches of the surface, a subsoil plow should be used. The harrow and leveler should follow before the ground has time to dry out. Then plant as soon as possible with a good press drill, or disc drill with press wheels attached, if small grain, beets, peas, beans, or similar crops, and with a combined lister and drill, if corn.

Be sure that the seed is planted to the proper depth and the soil firmly pressed down, upon and around it. This firming of the soil around the seed is of the utmost importance and is frequently neglected. Loose soil around the seed will dry out before the seed has time to germinate and then it will not come up until after rain or irrigation.

If the soil is in proper condition, and moist deep down at planting time, and the seed properly planted, the crop will start and grow up so as to shade the ground before the first irrigation becomes necessary, even in the dryest seasons; and when properly cultivated, a good crop may be expected in average seasons and soil without further irrigation.

A good start and a good stand are more than half the battle.

LISTING. The Kansas farmers usually failed with the corn crop until they adopted the listing method, and it is probable that listing will make a great improvement in farming in New Mexico, with the corn crop and possibly with some other crops now generally planted with an ordinary drill. As the corn grows in the listing furrows, the fine soil is worked around the plants by light harrows so that the furrows are soon filled up and the roots of the corn are deep down where the moisture is and will withstand drought much better than when planted near the surface. The ground can be cultivated several times before irrigation becomes necessary and the crop will usually not require irrigating until it begins to tassel out.

CULTIVATION. The greatest aid to economy in the use of water is frequent cultivation. Moisture comes to the surface and escapes through capillaries and cracks. Frequent stirring of the top soil breaks up the capillary tubes and fills up the cracks. A few inches of finely pulverized soil on top effectually checks evaporation and will keep moisture in the lower soil for a long time. Evaporation is much greater from the soil near the surface because its temperature is much higher and because hot winds quickly dry it out. The difference in temperature of the surface soil and soil under six inches of dirt mulch, is about 35 degrees in hot weather, because the fine pulverized dirt is a poor conductor of heat.

Careful experiments made by United States Government experts show that the evaporation loss from uncultivated soil is two to four times greater than from soil properly cultivated. The deeper the dirt mulch the better it will prevent evaporation, and cultivation should be six inches deep except where it might disturb shallow rooted plants.

With improved, wide implements for stirring the top soil, such cultivation is not very expensive, and one man with plenty of horse power can cultivate several times as much ground in a day as could formerly be done with ordinary implements.

An interesting fact not generally understood or considered in irrigation farming, is that plants grow in proportion to the amount of moisture evaporated through their pores or leaves. The more moisture thus evaporated the faster they grow. Therefore the object should be to moisten the ground under and around the plant roots as deeply as possible and then, by frequent cultivation of the top soil, check evaporation through the soil and force the moisture to evaporate only through the plants.

Cultivation should follow each rain or irrigation as soon as the ground is mellow enough to be worked and before it bakes or cracks. During long periods of drought also, cultivation is beneficial, because nature is always at work trying to form capillaries for the underlying moisture to escape through the dry soil.

With small grain where no other means of cultivation are at hand, a good iron roller, used immediately after planting and as soon as the top soil is dry enough after each rain or irrigation, will prevent the forming of a crust and cracking of the surface and it can be used without injury to the crop until it is nearly ready to head out. The roller made a success of wheat raising in Western Kansas after other methods failed.

COMBINING THE CAMPBELL SYSTEM WITH IRRIGATION. It has been proven by experiment in many places in the Rocky Mountain region that with one thorough irrigation before planting and frequent cultivation, good crops can be raised without other irrigation—even where there was only 2½ inches of rainfall during the growing season. The dry farmers have demonstrated that they can raise good crops whenever they can collect enough moisture in the soil from rain before planting, and the writer believes that the time is not far distant when the Campbell system of dry farming will be successfully combined with irrigation wherever the soil is suitable and that it will more than double the duty of water—that is, cause twice as much production with the same amount of water. This prediction is made notwithstanding the oft-heard remark that irrigation spoils the soil for dry farming. This may be true with some kinds of soil, if the water is applied by flooding in hot weather, but deep furrow irrigation in the fall, winter or spring, when there is little evaporation, and when the sun rays are not hot enough to bake and crack the soil, followed by the Campbell method of farm-

ing, will produce a good crop anywhere in the semi-arid region where the soil is at all suitable for that method.

Deep vs. Shallow Irrigation. The bane of irrigation farming is the prevalent custom of frequent shallow watering by flooding or by too shallow furrows. This requires too much labor and causes great waste of water, which quickly evaporates from soil near the surface. It causes the roots of plants to grow near the surface, both because the moisture is there and because it forms a "hard-pan" a few inches below the surface into which neither the roots nor water will readily permeate. If the moisture is under the plants the roots will go down. The object should be to moisten the soil as deep as possible and then, by frequent cultivation of the top soil check evaporation and keep the moisture in the ground as long as possible, or at least prevent evaporation except through the plants.

By the usual flooding methods and by shallow furrow irrigation we saturate and puddle the top soil in order to get some moisture down to where the plant roots ought to be. This top soil will dry out, bake and crack in the hot sunshine and hot dry winds and more than half the water applied will evaporate before cultivation can check it.

If possible, we should do just the reverse, i. e., saturate the subsoil where the roots are, leaving the top soil comparatively dry, so it can be thoroughly pulverized before much evaporation takes place.

This can be done by the use of subsoil cutters and deep furrow irrigation.

There may be exceptional soils, such as those underlaid with quicksand or coarse gravel at shallow depth, where deep irrigation is not practicable, but generally it will be beneficial to crops and result in great economy, both as to labor and water.

Subsoiling. The use of a subsoil plow to break the hard-pan in old fields and pasture lands, so the water will go down deep, will do much good. A subsoiling implement for renovating old alfalfa fields, orchards and meadows without turning over the soil, is made with a strong upright steel coulter fastened to a beam and having a small flat or wedge-shaped foot on the lower end of the coulter to keep it in the ground, and a gauge wheel under the front end of the beam to regulate the depth. This implement must be made very strong so as to permit the use of six to eight horses if necessary, and must be kept sharp. The soil must be irrigated a few days before using it.

The roots of old trees and plants become interwoven, the soil of old orchards, fields and meadows become packed and hard. By trimming the roots and loosening up the soil every few years with such an implement, much less water will be required, the yield will be greatly increased and the dry, hard, barren spots and streaks so frequent in old fields, will be avoided. Some damage has been done by cutting too close to shallow rooted trees. The cutter should be run midway between old trees and about the ends of roots of young trees. The use of this instrument in alfalfa fields will thicken up the stand and cause it to grow much faster and taller.

Alfalfa. This valuable plant will produce from three to five crops each year for a hundred years, if properly treated, and can easily be made to yield from two to three tons at each cutting. A good stand requires about the same amount of water and labor, as a poor one, and the difference in profits on a 40 acre field is usually from $600 to $1,000 per annum. For this crop the ground should be plowed very deep so the roots and the water can go down deep without encountering any hard-pan. Plenty of fresh seed should be planted, with a disc press drill, after the seed bed has been carefully prepared and leveled and when there is sufficient moisture in the soil to cause the plants to come up and grow so as to shade the ground before irrigation becomes necessary. The rows should be on a uniform grade, following the contour of the surface, as for furrow irrigation. It does better without a "nurse crop". Oats or weeds do more harm by exhausting the soil moisture, than good by shading the young plants. The sunshine will not injure the plants if there is plenty of moisture under them. The mower should be run over the field when the plants are a few inches high to check the growth of weeds and cause the plants to root better. The cuttings should be left on the ground for a mulch. After the second year or after the plants have become well rooted, thorough cultivation is necessary to prevent the packing of the soil around them. The disc harrow, or some one of the harrows or cultivators especially designed for cultivating alfalfa, should be run over the field both ways, when the top soil is mellow, every spring and after each cutting. There is no danger of injuring the plants. The cutting of the crowns causes new shoots to grow and the stand will get thicker each year.

The use of the subsoil cutter every two or three years will be of great benefit.

With a good stand and deeply plowed soil, one thorough irrigation will usually be sufficient for each cutting.

Proper Time for Irrigating. Many works on irrigation give directions for applying water at stated intervals—sometimes as short as five to fifteen days. It is possible that such frequent waterings may be necessary in some soils and in hot, dry climates where hot winds prevail and evaporation is great, but such directions are misleading to farmers in New Mexico and throughout the Rocky Mountain region.

In determining when and how to irrigate, the farmers must consider the character of the soil, the season as to temperature and amount and periods of rainfall, and the requirements of different kinds of crops. Experience is the best teacher and the farmer soon learns to tell by the appearance of the plants when they require water. This is the best test. Testing the soil for percentage of moisture is uncertain without a careful study of the particular soil, because some soils require a greater percentage of water than others to produce good crops.

The farmer will also learn to time his planting so as to take advantage of the usual rainy season. In Northern New Mexico, for instance, the regular rainy season comes in July and lasts about six weeks. If the crop be planted after a thorough irrigation in spring when the streams are all full from melting snow, by proper cultivation it can be kept growing until the rainy season begins. The rains will then keep it growing and it will ripen after the rain ceases.

Along the prairies near the base of the mountains and for 100 miles or more out on the prairies, dashing rains sometimes occur causing floods which usually run to waste and do much damage in the lower country. By a system of flood ditches and having permanent dams and gates, such flood waters can be utilized. They are usually full of rich sendiment, which will be equal to a coating of manure as a fertilizer, and will greatly increase the yield of alfalfa, meadows and orchards.

Fall and Winter Irrigation. It is claimed that water applied in the fall or winter will do more good than a like amount applied in summer. Certainly for meadows, alfalfa fields, orchards and also for land to be planted next spring, it is very beneficial and should be done wherever possible. The action of frost on moist land loosens it up and perhaps starts some chemical action which is beneficial to plant life. Trees so irrigated will be stronger to withstand cold weather and spring frosts, and where mulching with straw can be done after irrigation and a hard freeze, it is claimed that the trees will bloom several weeks later and be more certain to escape spring frosts.

In irrigating growing crops, farmers should always remember that there is more danger of applying too much water than too little. Statistics from irrigation districts all over the world, allowing for variations in rainfall and in climate, show that the best yields come from a moderate use of water.

If the crop should be injured by too much water, there is no way to remedy it, but if not enough water is applied, that can be easily cured by another irrigation.

Farmers used to other conditions may, at first, think that irrigation farming requires too much care and attention. After a little experience they will realize that their profits are much greater and that they have a "sure thing".

By giving to his business the extra care and attention, the irrigation farmer can be certain to raise a bumper crop every year, without fail, which is worth two or three times as much as the average crop grown in the best corn belt states. The rich soil under irrigation will support more plants to the acre than the soil of the older farming countries in the "rain belt", and with a little care and forethought it is possible to cause every plant to develop and mature without danger of injury from flood or drought.

But the water in the stream or reservoir will be the source of his prosperity and there should be constant study and effort to use as little of it as needed to accomplish the best results.

Much good has been done and much more will be done by the United States Department of Agriculture, by Agricultural Colleges and Experiment Stations, and by State and Territorial Irrigation Engineers in experimenting and in disseminating useful knowledge on this subject; but in the long run, this, as all other agricultural problems, will be solved by the genius, intelligence and industry of the American farmer, who has done more than all else to place the United States in its present high rank among the nations.

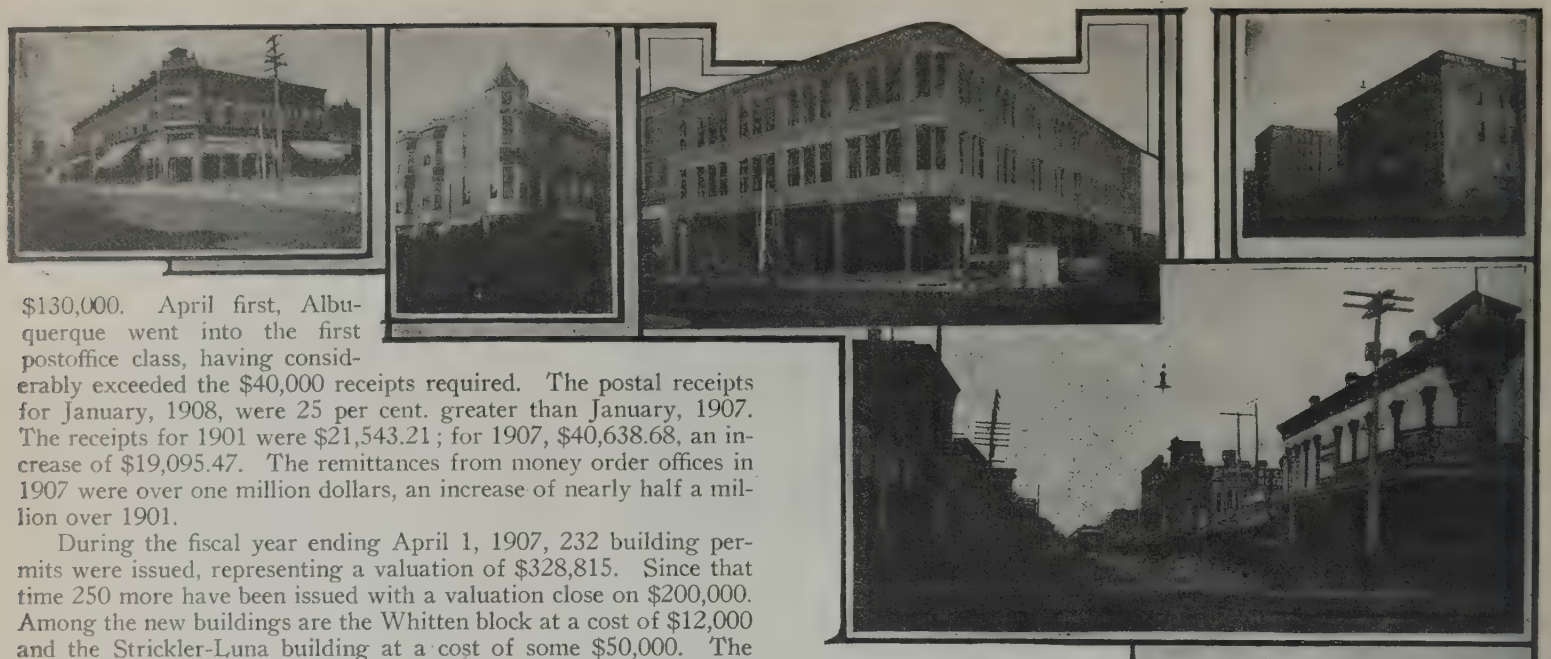
Albuquerque, The Hostess City

By E. DANA JOHNSON.

ALBUQUERQUE, NEW MEXICO, 25 years old, has 25,000 population and is the commercial and railroad center of a territory 500 miles square. It is the chief city of New Mexico, whose population has increased 100,000 in five years and whose resources are unlimited. It is the chief city of the Great Southwest, 540,000 square miles, with 2,000,000 population. It is the chief city of the 300-mile long Rio Grande Valley, the most fertile in the world, upon the irrigation of which the Government is spending millions. It is the center of a prosperous agricultural section and has the finest climate in the United States. It is the chief point on the main line of the Santa Fe Railway between Topeka and Los Angeles, is 525 miles south of Denver and 254 miles north of El Paso, Texas. It has the second largest shops on the Santa Fe and an immense tie treating plant. It has a splendid $200,000 hotel, the Alvarado, and many other fine hotels. It has three daily newspapers and four weeklies. One morning daily has the full Associated Press leased wire news report. It has six miles of trolley lines, fine water supply, fire department, electric lights, gas, and sewer system. It has a first grade postoffice. It is the seat of the biggest timber industry in the Southwest; the shipping point for the third greatest sheep raising section in the Union, and the wool and textile center of the Southwest. It has an immense wholesale and retail trade; large manufactories; theaters, churches, libraries, a University, Government Indian School and public school system. It has fine, modern stores and imposing business blocks, handsome residences and banks with $5,000,000 deposits. It has an active Commercial Club and is the city where the Sixteenth National Irrigation Congress will be held at a cost of $100,000. It has doubled in population in five years.

The city has 50 miles of fine streets and the best of cement sidewalks; has great sanitariums for healthseekers; is the shipping point of prosperous mining districts. Albuquerque will be the most important railway center in the southwest. Lines are projected or building to the vast coal fields of San Juan county in the northwest; the Hagan coal fields in the east; to the fertile Estancia Valley, the rich agricultural section just across a narrow mountain range; to the undeveloped riches of Socorro county and South Central New Mexico and elsewhere. Albuquerque is connected by swift automobile lines with outlying camps and towns. It has two telegraph companies, a long distance telephone service; two electric call systems and every modern improvement. It has a pushing, intelligent population all working unitedly for a greater Albuquerque. Every citizen is a booster. Albuquerque offers the chance of a lifetime for investor, healthseeker, professional or business man or the man looking for success. Albuquerque's city government and public utilities are second to no city of its size in the West. The city will this year erect a new City Hall at a cost of $30,000. It is just now installing the pumping plant for an elaborate $100,000 sewer system, with 25 miles of mains which will be immediately installed. The health department is well conducted and Albuquerque bears the reputation of the cleanest and most sanitary city in the territories.

The city is efficiently policed and licensed gambling and the Sunday saloon have been outlawed. There are twenty-five miles of cement sidewalks with many additional miles under construction. An up-to-date water supply system secures the purest of water in unlimited quantities from deep wells, a reservoir on the mesa at a height of 500 feet, furnishing a strong pressure of water for the fire department, which is efficient and well organized and equipped. An auxiliary fire station in the Highlands has been put in and a new steamer will be purchased at once. There is a modern gas plant, electric light and power from a big plant and a splendid electric street car system with six miles of track. The Colorado Telephone system gives long distance connection to all points in Central and Northern New Mexico and Colorado and as far east as Kansas City and Chicago. The city is an important relay station for through telegraph business. Work has begun on a new Federal building, to contain the Postoffice, the appropriation for which is



$130,000. April first, Albuquerque went into the first postoffice class, having considerably exceeded the $40,000 receipts required. The postal receipts for January, 1908, were 25 per cent. greater than January, 1907. The receipts for 1901 were $21,543.21; for 1907, $40,638.68, an increase of $19,095.47. The remittances from money order offices in 1907 were over one million dollars, an increase of nearly half a million over 1901.

During the fiscal year ending April 1, 1907, 232 building permits were issued, representing a valuation of $328,815. Since that time 250 more have been issued with a valuation close on $200,000. Among the new buildings are the Whitten block at a cost of $12,000 and the Strickler-Luna building at a cost of some $50,000. The city's assessed valuation is three and a half millions. Property values are increasing at a phenomenal rate in Albuquerque. An important index to business is telegraphic traffic. The Santa Fe operators here handle 8,000 messages a month. Fifteen Santa Fe wires connect with the office and take battery here. The Western Union and Postal Telegraph companies handle $30,000 business annually. The Western Union has 15 wires into the city and the Postal fifteen. The Postal office in Albuquerque is a wire-testing and repeating and battery station. Both companies require a large force of operators to handle the Albuquerque business. Albuquerque, 25 years ago a mere station, is now one of the most prosperous modern cities in the Southwest. There is no city in the Rocky Mountain regions whose growth has equalled it. There is no other which has such flattering prospects for future growth.

Albuquerque is justly to be called an extraordinary town. It is just 25 years old. Its population is fairly estimated at 25,000 and it has never had a boom. There are plenty of towns of 25,000 people in the United States which are twenty-five years old and under, but so far as is known these towns, without exception, have been boom towns which have caught the flood-tide of development in some new country; but Albuquerque has had no flood-tide of new and unexpected development, either in her surrounding territory, or at home. The growth has been steady, persistent, the proportion of each year surpassing that of the last, but never with anything of flurry or excitement. The present townsite of Albuquerque was located in 1880 when the construction camps of the Atchison, Topeka and Santa Fe Railway found their way in from the North and East. Albuquerque's period of steady development set in and it has continued ever since. There has been no check to the steady forward movement which has led to the Albuquerque of today with its handsome business and residence streets, its public buildings and schools and churches, its progressive business and pleasant social life. A great railroad man, one of the master builders of the country once said of Albuquerque, "It is built one-fourth on prospects, one-fourth on actual business and the rest on public spirit and a united community." This has been often quoted. It is not true for Albuquerque and every interest she has acquired is founded on proven values; yet it illustrates the kind of public spirit that has helped along the actual natural development. It is a fair example of what public spirit means in Albuquerque when it is stated that during the past five years $275,000 have been subscribed by citizens and business houses for public purposes, such as the promotion of manufacturing enterprises and public works generally. Half a million is a conservative estimate of the amount subscribed here in this way for public purposes since the town was founded. This certainty of future development comes from Albuquerque's geographical location. This city is almost in the geographical center of New Mexico. It reaches out on direct rail lines east, west, north and south, into every section of the Territory except the northwest corner. It will soon have direct rail connection therewith through the building of the Arizona and Colorado Railroad. North and south stretches the wide, flat valley of the Rio Grande. In the vicinity of Albuquerque the valley is from five to ten miles wide, everywhere threaded with rippling irrigating canals, a checker-board of farms, meadows and gardens. East the rolling table-lands covered with waving grass and dotted with

View in Business District

Woman's Club

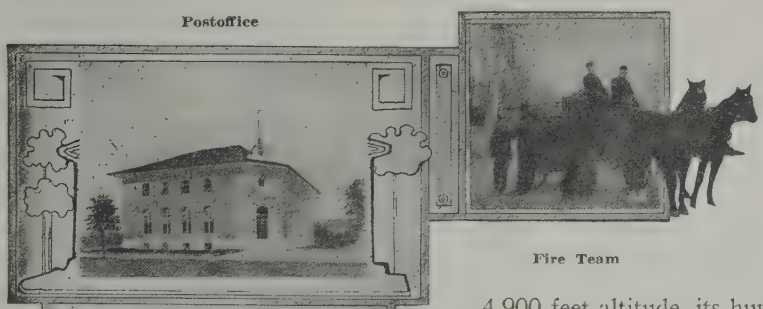
homesteads, stretch nearly ten miles to the Sandia and Manzano mountain ranges. West lie more undulating plains where countless herds graze, breaking twenty miles distant at the edge of the valley of the Rio Puerco.

Albuquerque is famed for the number and activity of its fraternal and social organizations. There are some forty or fifty fraternal, secret, benevolent and social men's organizations. The Elks are among the strongest with a membership of over 400 and have erected a splendid $75,000 theater building.

Club rooms, spacious banquet and ball rooms, armory, buffet, billiard rooms and offices are included in the Elks' building. The theater which has good fire protection, seats 2,000 people and is the best between Denver and Los Angeles.

The various orders of the Masonic fraternity are especially strong in Albuquerque and meet in a commodious and well furnished Temple. The Knights of Columbus, Odd Fellows, and others have strong fraternal organizations. The Woman's Club, with 100 members, while only four years old has a new $6,000 club building and is prominent in social and philanthropic work. Other woman's organizations are the Non-Sectarian Benevolent Society, Lew Wallace Chapter Daughters of the Revolution, and numerous literary, musical and dramatic clubs and ladies' auxiliary societies. There are many athletic and social organizations.

Postoffice



Fire Team

City Hall

Colombo Hall, seating 1,500 people, is a favorite place for public meetings. The National Guard Armory and Convention Hall cost $30,000 and will seat 4,000 people. Albuquerque secures many of the best metropolitan theatrical attractions every season, as it is the best place for high class companies to break the long trip from Denver or Kansas City to Los Angeles. Excellent stock companies fill long summer engagements at the Elks' Theater and at the pretty Casino, a summer theater erected by the Albuquerque Traction Company at Traction Park at a cost of $10,000.

Albuquerque is fast gaining a reputation as a convention site. Large territorial and southwestern conventions are always held here. In December, 1907, was held the meeting of the Geological Society of America. The National Irrigation Congress this fall and many other similar gatherings are in prospect. The city has an excellent public library, costing $30,000 with 7,000 volumes on file. The Central High School also has a fine library. There is a large class of literary and musical people in the city and many lectures and concerts occur. There are numerous and prosperous state clubs including the Indiana and Michigan societies and others.

Among the fraternal orders represented in the city beside those before mentioned are the Red Men, the Independent Order of Odd Fellows, the Modern Woodmen of America, the Woodmen of the World, the Ancient Order of United Workmen, the Fraternal Order of Eagles, the Fraternal Brotherhood, the Fraternal Union of America, the Knights of Pythias, white and colored; the Grand Army of the Republic and its auxiliaries, the Woman's Relief Corps and the Ladies of the G. A. R.; the Independent Order of Foresters, the Knights of the Maccabees, the Harugari Society, the Italian Society of Christopher Columbus, the Catholic Knights of America, B'Nai Brith, the Mutual Protective Society of old Albuquerque, and others. There are some thirty labor organizations, including the railway unions. The unions are conducted upon conservative lines and there has never been a serious strike.

The Commercial Club of Albuquerque was organized with a small membership of enterprising citizens some fifteen years ago and in that time has grown to be one of the strongest and most successful commercial organizations in the Southwest. The Club has always taken an active and important part in the development of the city and its surrounding resources and through its persevering work were brought here many of the large enterprises which now form the basis of the city's prosperity. Its members have always believed that nothing is too big to be landed with the proper kind of effort and they have generally secured what they have gone after. The Club now has a beautiful red-stone building, half a block long and three stories in height, massive in architectural style, spacious and luxuriously furnished. The Club now has a membership of over three hundred and is increasingly rapidly. The membership includes the most prominent business men and citizens of Albuquerque who are noted for the unanimity with which they work for the best interests of the city and its industrial expansion.

Without exception Albuquerque has the finest climate the year around to be found in the United States. New Mexico is the world's sanitarium for consumptives and Albuquerque, by scientific observation, is the dryest and most healthful spot in the Territory. With the pure, bracing air of 4,900 feet altitude, its humidity is negligible, the rain fall is 8 to 10 inches or less annually, there is no snowfall and nature's greatest germicide, the sun, shines brilliantly for over 300 days in the year. There are on an average 25 cloudy days and 25 days partly cloudy in the year. The highest sensible temperature is about 80 degrees and the lowest sensible temperature, very rare, about 20 degrees above zero. The city is well protected from storms. In every direction across the rolling mesa lands can be seen mountains, some reaching an elevation of 10,000 feet, full of dense forests, wild game, trout streams, healing hot springs, a campers', hunters' and health-seekers' paradise where it is possible to live out of doors all the year round. There are dozens of health resorts easily reached by the railroad, automobile or stage lines over splendid roads, the Jemez Hot Springs, Pecos National Forest, Whitcomb Springs, Faywood Hot Springs, Hell Canyon, Bear Canyon, Coyote Mineral Springs, Tijeras Canyon and the wilds of the Santa Fe, Jemez,

Commercial Club

Sandia, Manzano and other mountain ranges. The city has many roomy hotels, including the beautiful Alvarado, the finest in the Southwest; numerous rooming houses and tent cottages. There are a number of ranch resorts in the country.

At Albuquerque, the Santa Fe has a $50,000 three-story hospital under the direction of a surgeon and ten assistants. The Sisters of Charity conduct the $100,000 four-story St. Joseph's Hospital with a capacity of 100 patients and 2,500 cases handled to date. It has a splendid equipment, operating room, charity ward, contagious disease isolated wards and heating plant. It is five years old and has a staff of skillful physicians appointed by the County Medical Association. Hundreds of tubercular sufferers have found long life and health in Albuquerque and a number of additional sanitariums are projected. There is a fine natatorium in the city and a golf club has been organized while there are a dozen collegiate and city athletic organizations. Albuquerque has been chosen as the site for the National Tubercular Sanitarium of the Presbyterian church which will be erected at an initial cost of $50,000 and which will eventually cost many times that amount as it is increased in size. The committee after an exhaustive inspection of other sites decided that Albuquerque's climate is the best in the country for tubercular sufferers. Careful study was made of the advantages offered by other places in New Mexico and it was found that nowhere is the same ideal combination of dryness, medium altitude and large percentage of sunshine. Scientific research by the Climatological Laboratory of the University of New Mexico results in the finding that nowhere in New Mexico is it possible to spend so much time out of doors.

Albuquerque has four banking houses well established and well managed and forming a banking community of which any city of four times the city's present population might well be proud.

Albuquerque is the financial center of New Mexico; it is the center of the lumbering interests; of the enormous sheep and wool growing industry; headquarters for the Santa Fe Coast Lines; disbursing headquarters for several of the Government departments in the Southwest and its financial interests and operations are therefore large. The First National Bank of Albuquerque is one of the oldest and in point of resources the strongest bank not only in New Mexico, but in the entire Southwest. Its deposits, Feb. 14, 1908, were $2,487,708.69, the statement of that date being fairly representative of the standing of the bank during several years past. It occupies its own banking house, one of the finest in the West, equipped with all modern safety devices and supplied with commodious safe deposit department. The financial operations of the First National Bank extend to all sections of the Southwest and the facilities offered to its customers are equal to those of any banking institution in the country. It is a depository for the United States Government and for the Santa Fe Railway. The Montezuma Trust Company, organized under the laws of New Mexico, is a thoroughly established and well managed institution of $100,000 capital including in its directorate several of the strongest business men in New Mexico and offering to its patrons all the facilities not only of a

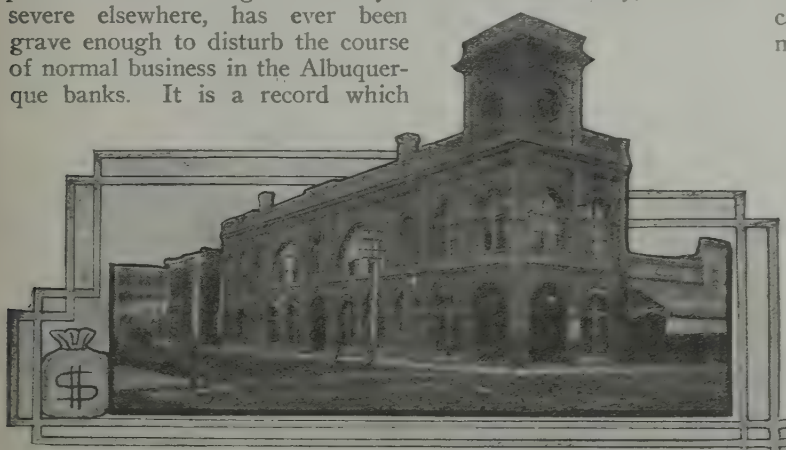
Robinson Park and Environs

Montezuma Trust Company

First National Bank

general banking business, but the wider operations of the Trust Company. The Bank of Commerce, next to the First National, the oldest bank in Albuquerque, is organized under the laws of New Mexico and is one of the leading banking institutions of the Southwest, doing an extensive and rapidly growing business and numbering in the list of its directors and patrons many of the strongest financial interests in the Territory. The institution is under the direction of conservative and capable bankers and is one of the strongest sections in the financial foundation of the city. The bank occupies handsome offices in the N. T. Armijo building, corner of Central and Second Street, one of the most favorable locations in the city. The State National Bank, while the youngest banking house in the city, is already one of the strongest financial institutions in the Southwest. It was organized in 1904 and under the direction of careful and capable bankers has advanced rapidly in the extent of its operations and in the confidence of the public until it now occupies an enviable position. The bank has recently acquired its own banking house by the purchase of the Zieger Building, corner of Central and Second Street, one of the best locations in the city, the building having been remodeled on special designs, its furnishings being the most elegant and elaborate of any institution of the kind in New Mexico.

Taken as a whole the banking institutions of Albuquerque form a most satisfactory indication of the solid foundation upon which the city's business interests rest. With combined deposits of close to $5,000,000, with conservative and careful management, with ample facilities for the transaction of business, Albuquerque is justly proud of her banking community. No financial flurry, however severe elsewhere, has ever been grave enough to disturb the course of normal business in the Albuquerque banks. It is a record which speaks for the stability of business conditions in the chief city of New Mexico.



State National Bank

Albuquerque is the center of a wholesale trade in every variety of merchandise that extends for 300 miles in every direction. Her numerous wholesale firms supply business houses in every town in New Mexico, all over Arizona, as far north as Denver, and well into Texas and Mexico. Some lines of goods are sold all over the United States, including products peculiar to New Mexico such as Indian blankets and curios, thousands of which are shipped out of the Territory annually by the John Lee Clarke Company and others. Albuquerque's yearly wholesale trade amounts to millions of dollars and there is probably no city of its size in the entire West that ships goods over such a wide extent of country. Immense shipments of groceries and provisions are made from this point. Hardware, farming implements and building materials, mining machinery and supplies, guns and ammunition, plumbing supplies and similar goods are extensively handled.

The wholesale dry goods business in Albuquerque, built up in ten or fifteen years, is one of the leading branches of the trade, two or three large houses covering practically the whole Southwest. Pianos are shipped all over New Mexico and Arizona. There are big harness and saddlery houses which supply also large numbers of buggies and wagons. One of the largest carpet and furniture houses between Denver and Los Angeles is located here. There are three or four large wholesale liquor houses and a big cigar and tobacco establishment. Fruits and produce are handled at wholesale as are grain and feed. There are a number of big wholesale wool and hide houses. The majority of the big wholesale men are those who came to New Mexico with the advance guard of civilization and built up great establishments with the rapid growth and development of the country. The Albuquerque wholesale firms are housed in splendid modern buildings.

Before all other industries in magnitude is that of the American Lumber Company, with a capital stock of $8,000,000, which has in Albuquerque one of the largest lumber manufacturing establishments in the United States. Between 30 and 40 car loads of pine logs come in to the mills every day from the company's lumber camps on its vast tract of virgin pine in the Zuni mountains. The main saw mill has a capacity of 350,000 feet daily; box factory,

Bank of Commerce

Albuquerque Foundry

Superior Planing Mill

Southwestern Brewery

100,000 feet; the sash and door factory and other departments of the plant turn out daily 100,000 feet of mouldings; 50,000 feet of lath; 50,000 shingles, 2,000 windows and 1,500 doors. The average stock of lumber in the yards is twenty millions of feet. The white pine finish turned out at these mills has given complete satisfaction in all the markets of the country and the products of the mills are in the greatest demand all over the United States. The company's Albuquerque plant covers 120 acres of ground. It has two steam plants of six boilers each and three engines of 500, 750 and 850 horse-power. There are five miles of track at the plant and the big log-pond holds 4,000 feet of logs. In Albuquerque and including the logging equipment in the woods there is over a million dollars invested. The company has its own electric light plant, fire alarm system and fire fighting corps and every provision is made for the care and safety of the employes. A comfortable hotel and lodging house for the men is conducted close to the grounds. Social and musical organizations and athletic clubs are maintained by the men. The company has its own medical department. A thousand men are employed at the mills and over 500 in the logging camps. The Albuquerque plant is equipped with the very latest and most improved machinery. In the woods the company has fifty-five miles of track, owns six modern locomotives and 160 standard guage logging cars. At the headquarters camp at Kettner, there is maintained a roundhouse and machine shop, hotel and commissary. There are three other logging camps and a large number of horses and extensive logging equipment are necessary for the woods operations. The company owns 300,000 acres of timber land in fee and other lands which bring the total extent of timber country to be cut over to the immense total of nearly a half million acres. The pine trees so far have been cut off 27,000 acres and there is approximately a billion and a half feet of timber still to be cut, enough to keep the mills running for 30 years, the timber thus far having been cut at the rate of 50,000,000 feet a year.

Packing Houses

Albuquerque is the most important point on the transcontinental lines of the Atchison, Topeka and Santa Fe Railway between Topeka and Los Angeles. It is the intersection of the main line and the Coast Lines, the Rio Grande Division and the "Ten Million Dollar Cut-off" just completed at a cost of more than ten millions of dollars by the Santa Fe. It has the most important railroad shops between Topeka and the Coast, employing over a thousand men with a pay-roll of $60,000 per month. Extensive additions to these shops are in progress and projected, including a partially completed store house to cost $25,000. A tie treating plant with a capacity of 2,500 ties daily, built at a cost of $200,000, has been completed which will treat all the ties used by the Santa Fe System in the West. The Alvarado Hotel of the Harvey System is the finest railroad hotel on earth and cost $200,000. Albuquerque is the chief distribution point for the Fred Harvey news, curio and dining service in the Southwest. A new Recreation Hall is planned to cost about $30,000, the site for which is ready. The value of the Santa Fe Railway Company's property at Albuquerque is estimated at $3,500,000. The freight business amounts to millions of dollars annually. The trackage at this point is over fifty miles, immense new freight yards having just been completed at a cost of over $75,000. The Santa Fe stockyards handle 250,000 sheep, 75,000 cattle, 25,000 hogs and 2,000 horses annually. The company's Albuquerque property covers ten square miles or more. The shops do light repairs on 20 engines a month and general repairs on 19. Extensive car repair shops are maintained and 2,700 cars are repaired here monthly. This is the only Pullman division point between Chicago and Los Angeles and 15 crews make their headquarters at this point.

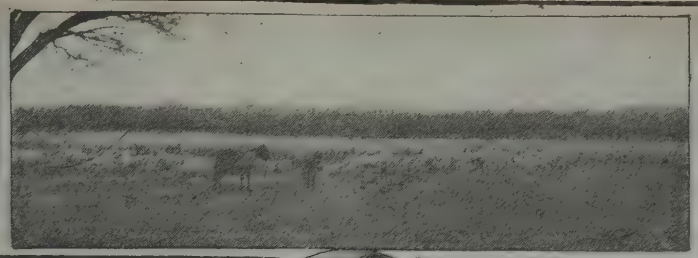
The grade of the Albuquerque-Eastern—now consolidated with the Santa Fe Central and known as the New Mexico Central Railway Company—from Albuquerque forty miles to the junction with the Santa Fe Central is completed, the road is financed and will soon be completed, thus giving the city a second direct eastern connection. An extension of the Santa Fe Central to Roswell and the Pecos Valley has been surveyed. The Rock Island has surveyed an air line from Tucumcari to Albuquerque.

Albuquerque's manufacturing industries, beside the woolen and lumber mills, include the Southwestern Brewery and Ice Company, with a capacity of 30,000 barrels of beer annually and 45 tons of ice daily, and a force of 30 men; the Albuquerque Foundry and Machine Works, which employs 60 men, covers four acres and turns out $100,000 in product annually; three bottling works, five wagon works, another ice plant and three improved laundries. There are two flouring mills and manufactories of electric supplies, harness and saddlery, confectionery; five cigar factories, printeries

Mansard Flour Mill

Cement Stone Plant

Brick Yards



Sheep Scenes in Bernalillo County

A Wool Train Coming Into Albuquerque

and binderies, an artificial stone plant, three brick yards and a number of big planing mills. A sugar beet factory is proposed and will be erected probably next year, as well as a burial case factory and a broom factory.

New Mexico is the third state or territory in the United States in wool production, being excelled only by Montana and Wyoming. The annual wool review for 1907 placed her sheep at 2,500,000, with 14,500,000 pounds of wool shrunk. The report of the Sheep Sanitary Board, however, shows that 5,800,000 sheep and lambs were clipped in 1907. Experts estimate that in the spring of 1908 the Territory will have over 5,000,000 sheep, which at an average of five pounds each, would make 25,000,000 pounds of wool. Albuquerque is the chief shipping point in the Southwest, millions being sent out yearly to the markets and feeding grounds. The William McIntosh wool clip for 1907 was shipped in ten cars, 200,000 pounds, netting $40,000. Fifty thousand sheep were shipped from Grants Station in two days. In November last a native sheepman sold here 9,000 lambs averaging 69 pounds, at 5½ cents. There are 300,000 acres of sheep grazing land in Bernalillo County and many wealthy raisers live in Albuquerque where there are also half a dozen big wool and hide firms. Albuquerque is the center of the wool trade and textile industry in the Southwest. The Albuquerque Wool Scouring Mills, J. M. Wilkinson, President, scoured six and a half million pounds of wool between March, 1907, and January, 1908, running night and day with a very large force of men. When improvements in the plant are completed the output will be 55,000 pounds of wool daily. The building will be 90 by 146 feet. The present warehouse holds 4,000,000 pounds of wool. The mills now have on hand half a million pounds, while in 1906 the plant scoured 5,000,000 pounds, the increase for 1907 being thus a million and a half pounds.

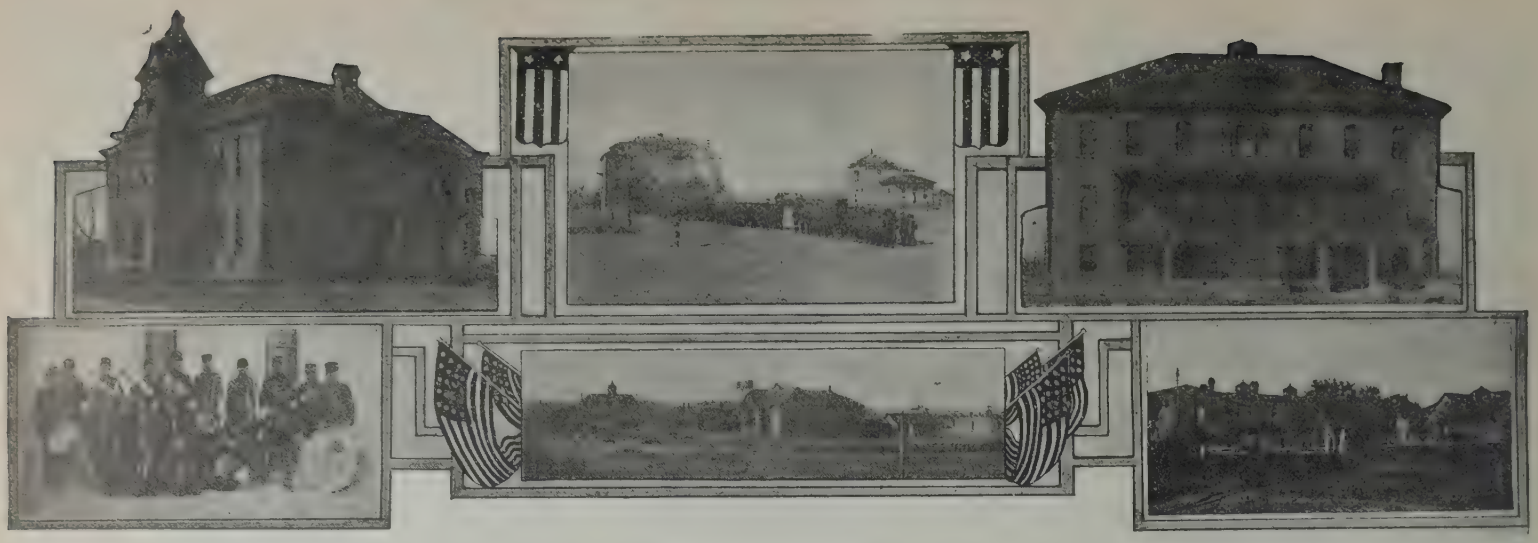
The Rio Grande Woolen Mills has an annual capacity of $200,000 worth of the finest clothing fabrics, blankets, tailor-made suits and other garments. The plant scours wool, it is pulled, dyed and woven in the same mill where skins are also tanned and mounted and art leather goods manufactured. The plant is an immense one with a large force of employes and it is conducted on the co-operative plan with thousands of stockholders.

The University of New Mexico at Albuquerque maintains an unexcelled standard of scholarship. It is co-educational and supported by the Territory. It has 200 students, 15 professors, covers 20 acres and has seven fine buildings, including a splendid gymnasium; has an ideal location, a beautiful campus and a fine irrigation system. It has four years preparatory and four years college course; includes a college of Arts and Sciences, Engineering School and Normal School and confers the established degrees. It has finely equipped laboratories in Biology, Zoology, Physics (2), Botany, Geology, Bacteriology, Climatology, Chemistry, Meteorology and Electricity; Mechanical Drafting rooms, and Machine Shop. Important research work has been done in Geology and Biology by the Hadley Climatological Laboratory and by the Departments of Education and Languages. Two new dormitories are in use which are unique in the world—built in imitation of the communal dwellings of the ancient Pueblo Indians, picturesque and beautiful. Other buildings in the same style are planned, all to be built around an immense rectangle or plaza on the plan of the ancient Pueblos. The buildings combine economy of construction, beauty, comfort, convenience and durability. They are furnished with steam heat, electric light and all modern conveniences. The men's dormitory has been given the Indian name "Kwa-ta-ka," meaning "Man-Eagle," and the women's dormitory "Ho-ko-na" or maiden. The present older buildings will be ultimately remodeled in the Pueblo style. The students issue a weekly paper and an annual; maintain athletic organizations, literary societies and fraternities and a dramatic club. The University atmosphere is wholesome and uplifting. Work done here is given full credit in Eastern Universities. The instructors are able and well qualified. The University was founded in 1892. The elective system of studies is followed.

Albuquerque has a public school system which is the pride of the Territory and compares favorably with any in the United States. The schools were established in 1891. There are fifty teachers with an enrollment of over 2,000 pupils; five handsome eight-room buildings, including the Central High School; the school property is worth $160,000 and the annual expenditures are nearly $50,000, with receipts of $55,000. Thirty thousand dollars were paid the teachers in 1907; the average salary of the High School teacher is $91.63; average salary lower teachers $66.50; highest salary except principals $70; principals $85 per month. In the six years since 1902 the enrollment has tripled and the number of teachers doubled; there are 4,000 children of school age in the city. The Albuquerque public school system offers a splendid 12-year study course, four years each in primary, grammar and high school. In 1907 the aggregate days attendance of all pupils was over 230,199.

Special instructors in art and music are supplied and the High School supports a glee club which is one of the best musical organizations in the city. Displays of the art work done by the students have excited the admiration of experts. The quarterly examination

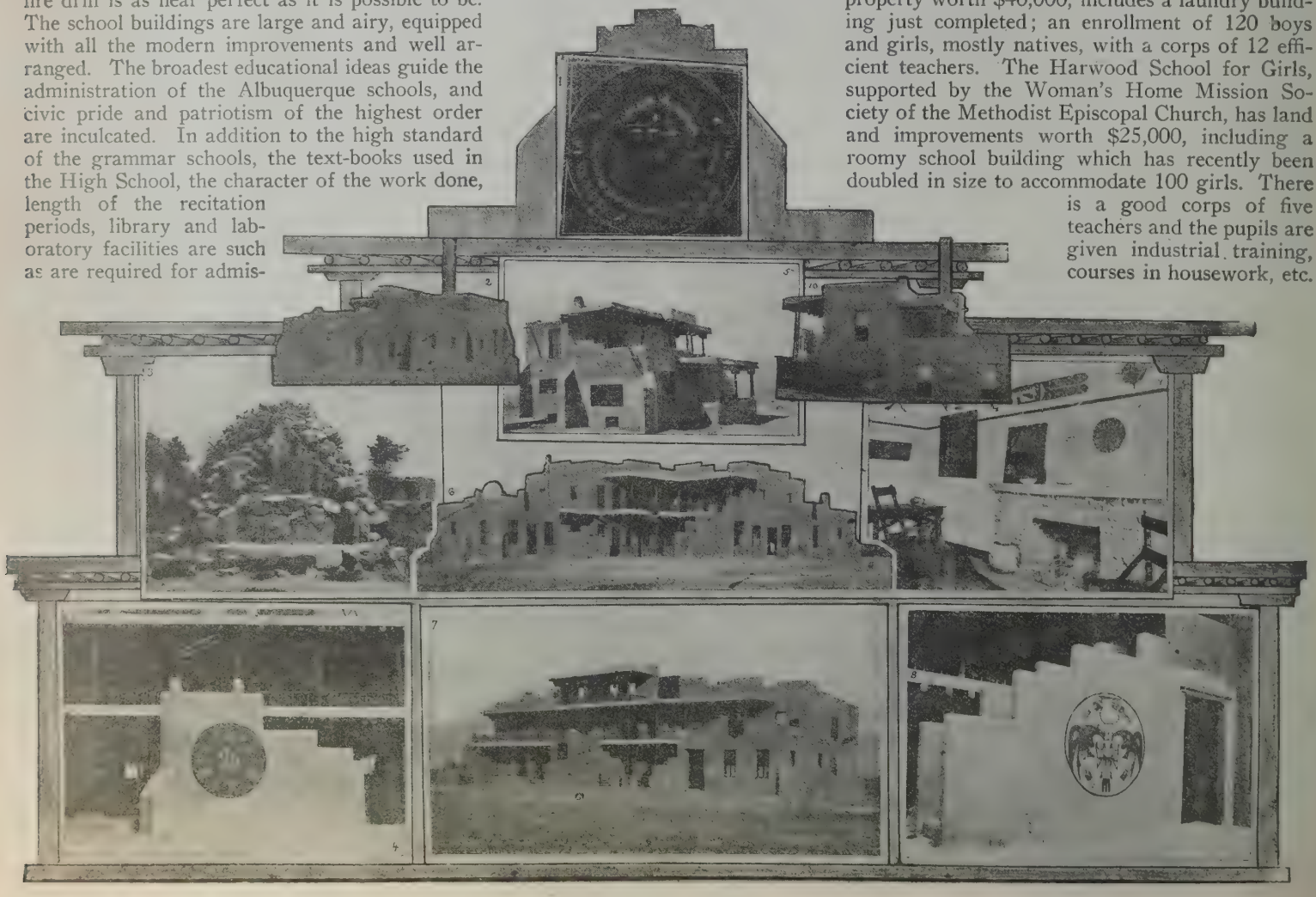
The Valley Near Albuquerque



United States Indian School

system is used. The course is equal to the best in any eastern city and the teachers qualifications far above the average. The tuition for non-resident pupils in the primary department is 75 cents per month; grammar department $1.25 per month, and high school $1.50 per month. The latest and best text-books are used, a new uniform text-book system having been adopted by the Territory.

The High School publishes a bright weekly paper, supports a basketball team and other athletic organizations and literary societies. The school board is composed of representative, progressive business men whose aim is to make Albuquerque's school system the very best in the West. A well drilled cadet-corps is an important adjunct to the High School. All of the school buildings are supplied with modern fire escapes and the efficacy of the children's fire drill is as near perfect as it is possible to be. The school buildings are large and airy, equipped with all the modern improvements and well arranged. The broadest educational ideas guide the administration of the Albuquerque schools, and civic pride and patriotism of the highest order are inculcated. In addition to the high standard of the grammar schools, the text-books used in the High School, the character of the work done, length of the recitation periods, library and laboratory facilities are such as are required for admission on diploma to the higher institutions. Albuquerque has numerous large and prosperous special and denominational schools. St. Vincent's Academy, conducted by the Sisters of Charity of Cincinnati, Ohio, is an institution with a splendid course of study and has a boarding school for girls. The school has a main building costing $40,000 and spacious grounds, with a force of ten teachers and an enrollment of 150, increasing from about 100 in the previous year. The Immaculate Conception co-educational school is in charge of the Jesuit Fathers, housed in a handsome stone building costing $26,000 and with commercial, business, scientific and classical courses. The enrollment this year is 400 and there are ten teachers. The Menaul Mission School supported by the Board of Home Missions of the Presbyterian Church has 200 acres of land, property worth $40,000, includes a laundry building just completed; an enrollment of 120 boys and girls, mostly natives, with a corps of 12 efficient teachers. The Harwood School for Girls, supported by the Woman's Home Mission Society of the Methodist Episcopal Church, has land and improvements worth $25,000, including a roomy school building which has recently been doubled in size to accommodate 100 girls. There is a good corps of five teachers and the pupils are given industrial training, courses in housework, etc.



Views of "University Pueblo"

Interior Presbyterian Church

Interior First Methodist Church

The Harwood Industrial School for Boys, supported by the Methodist Episcopal Church, has 200 acres of land and a fine new building just completed, with 50 boys taking courses in industrial training, the school property being worth $45,000. The Albuquerque Business College has a fine commercial course.

Some fifteen churches including a number of new and modern houses of worship that compare favorably with any in the West are located in Albuquerque. The First Presbyterian Church, with a membership of 300 recently completed a handsome edifice at a cost of $25,000 with a large pipe organ costing $5,000. The First Methodist Episcopal, 300 members, in the last few years has built a $20,000 church, a $5,000 parsonage and paid a debt of $6,000. The First Congregational Church has property valued at $15,000, a fine $2,500 pipe organ, and has a membership of 200 or more. The Catholic Church of the Immaculate Conception, with 1,000 members, has commenced the remodeling of its building at a cost of $15,000. The First Baptist Church has a handsome building with a membership of some 200. St. John's Episcopal Church, with 250 members, has church property worth $25,000. Temple Albert, the Jewish synagogue, was erected at a cost of $7,000 and the congregation numbers nearly 100. The Church of San Felipe de Neri in Old Albuquerque is one of the oldest and most picturesque in America. Other city churches are the German Lutheran, with a fine new building and a membership of 200; the First Church of Christ Disciples, the Highland Methodist Church, South; several colored churches, and many missions. The Christian Scientists hold weekly meetings.

First Presbyterian Church

The Brotherhood of St. Paul of the First Methodist Church, the Presbyterian Brotherhood and the Pilgrim Brotherhood of the First Congregational Church are strong men's organizations which exert a marked influence in religious and civil life. The regular auxiliary church societies are numerous and prosperous. There is also in the city a strong branch of the Woman's Christian Temperance Union, the Anti-Saloon League, the Humane Society and similar organizations, this city being the headquarters also for the Children's Home Society of New Mexico and Arizona, which is doing a remarkable work for the waifs of the Territory. Probably no other city of the size in the Southwest has so numerous and prosperous churches. Albuquerque is preeminently a city of beautiful homes. It is well laid out, with broad streets and walks and is notable for its innumerable beautiful trees which are so thick that a birds-eye view

ALBUQUERQUE CHURCHES

1. Congregational. 2. First Methodist Episcopal. 3. St. Paul's Lutheran. 4. Temple Albert. 5. Church of San Felipe de Neri, Old Albuquerque. 6. First Baptist. 7. Church of the Sacred Heart. 8. Church of the Immaculate Conception. 9. St. John's Episcopal. 10. Highland Methodist. 11. African Methodist.

Some Albuquerque Homes

of the residence portion of the city reveals only a dense mass of vivid green with a few housetops visible here and there. Albuquerque's best residence streets compare favorably with those of the famous cities of Southern California and many of the residences are palatial. The visitor is at once struck with the good taste shown in the architecture of the finer homes, the substantial and dignified, graceful style of modern construction being everywhere in evidence. Brick and stone are used chiefly in the construction of the larger residences, the Mission style, finished in pebble-plaster being also popular, the most beautiful example of this being the Hotel Alvarado. Many of the smaller cottages are built in bungalow style, which is at the same time inexpensive, picturesque and well adapted to the climate. There are beautiful parks, prettiest of which is Robinson Park in the west end of the city and many private residences are surrounded by beautiful and immaculately kept grounds.

There is of course, however, no argument which can for a moment compare with the magnificent climate, the life-giving ozone, the penetrating and electrifying sunshine which make life in Albuquerque a continual joy, both to the sick and the well. Public spirited men and women have formed a Civic Improvement Society whose object is a more beautiful and attractive and sanitary Albuquerque. A vigorous campaign of tree planting has been inaugurated. The pupils of the public schools have joined in the movement and each one has recently pledged himself to plant at least one flower, shrub or tree during the year and see that it is properly cared for. Unsightly buildings, bill boards and disorderly corner lots are under the ban and the city, always pretty and attractive, is undergoing a remarkable change, which will make Albuquerque in reality a City Beautiful.

Santa Fé, The City of the Holy Faith

By HON. L. BRADFORD PRINCE

SANTA FE is called "the most healthful place on the Continent," and "the most interesting town in the country," and it also claims to be the oldest city, continuously inhabited, in the United States, the only rival claimant to that distinction being St. Augustine.

However that may be, it is certainly not only the oldest Capital in the Great Republic, but one of the oldest in the world. Boston, which comes next in antiquity as a State Capital, is a quarter of a century younger, and the City of Mexico is the only Capital in the Western Hemisphere which antedates it; while in Europe, Berlin and St. Petersburg, The Hague and Brussels are far later in their history as seats of government.

Governor George Curry

Be it from a scenic standpoint or from the historic, archaeologic or climatic view, no other community in the United States can so well lay claim to the appellation of "unique," as this historic city founded in the first decade of the sixteen hundreds by the Spanish Conquistadores on the site of an ancient Indian Pueblo, one of the prehistoric houses which is occupied to this day and pointed out to tourists as the "oldest house" in the United States. It stands in the shadow of "the oldest church," that of San Miguel, piously erected, even before the habitations for the people. These structures, together with the "Old Palace," built early in the seventeenth century and continuously occupied by Spanish, Pueblo, Mexican and American governors, would, in themselves, be worthy of a pilgrimage from afar by the tourist; for who would not be interested in the oldest historic monuments in the United States?

Naturally the first Spanish settlement was made on the banks of the Rio Grande, as Onate's expedition of colonists followed the course of that river from Mexico in 1598; but they soon learned of the wonderful climate of the sheltered valley in the foothills of the great mountain range, where the high winds of the plains could not penetrate, and neither summer's heat nor winter's cold entered to mar the earthly Paradise; and so, in 1604, they left their first settlement of San Gabriel and established the permanent Capital at Santa Fe.

The City of the Holy Faith lies in the lap of the Sangre de Cristo Range which rises in several peaks to an elevation exceeding 12,500 feet within a few miles of the plaza, and from one of which flows the Santa Fe River, rising in two lakelets near the snow-line and furnishing the city with sparkling water from melted snow, absolutely uncontaminated and free from deleterious substances. Seven miles to the east lies the Pecos Forest Reserve of five hundred thousand acres, a natural forest and park of wondrous mountain and canon scenery, of numerous brooks and rivers, of untold mineral wealth, with picturesque summer cottages, a veritable paradise for the sportsman who is after big game such as mountain lion and bear, or in pursuit of deer and other of the gentler denizens of the forest, or the finny tribe of whom the mountain trout is esteemed most highly. Most fortunate is Santa Fe in possessing this vast play-ground across which the Territory with convict labor is building the famous Scenic Highway from Santa Fe to Las Vegas, thirty miles of which are completed and afford a drive that in some respects is unparalelled in this country for scenic beauty. West of Santa Fe lies another vast natural mountain park, the Jemez Forest Reserve, reaching as far as the Colorado boundary to the north and having within its boundary not only hot springs of tried curative properties, gold, silver, mica and other mines, beautiful forests and splendid mountain scenery, the White Rock and Brazos Canons, but also the most interesting archaeological region on the Western Continent north of Mexico. Here, within thirty miles of Santa Fe, are twenty thousand cave and cliff dwellings, some in the depths of deep chasms and canons, others on volcanic cliffs which are crowned with the ruins of communal buildings that have from one to a thousand and more rooms. Space forbids dwelling upon the wonders of this region, such as the Painted Cave, the Stone Tents, the Lions of Cochiti, the Frijoles Canyon, in themselves worthy a summer's outing, and which can be reached from Santa Fe in two hours by train and five hours by wagon road.

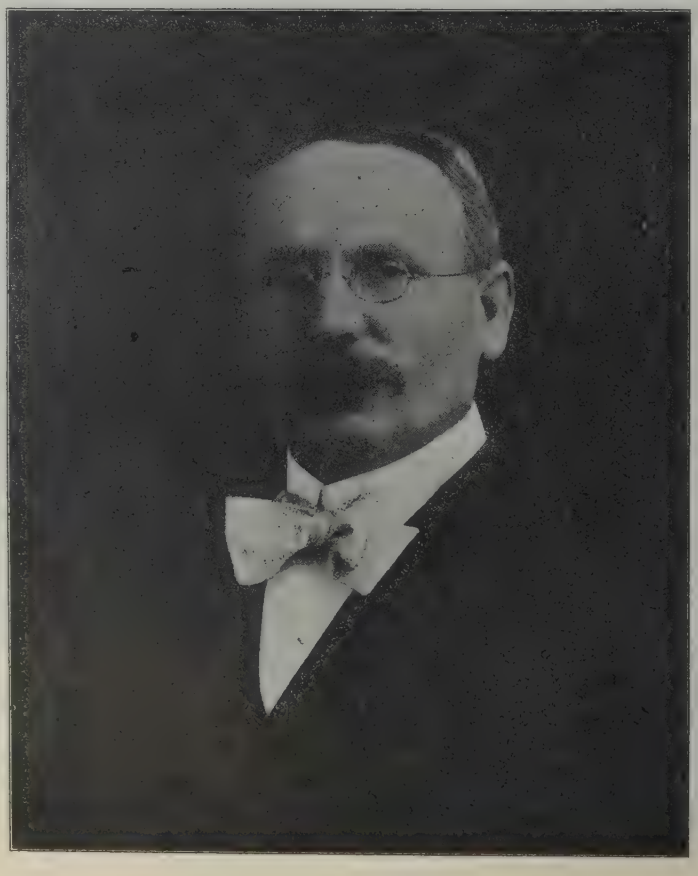
North of Santa Fe, beginning with Tesuque, nine miles away, and on a superb scenic wagon road, are the strange Indian pueblos, preserving to this day traditions antedating Columbus, celebrating their feast days with dances of heathen origin and mystic significance, occupied by a gentle and mysterious people. The Nambe Falls, the Espanola and Taos Valleys and numerous ancient mission churches and other points of interest are on this northward branch of one of the main roads into Colorado. In every direction from Santa Fe are the ruins of pueblos once occupied by these "town Indians" and over which are strewn thousands, yea, millions of pieces of prehistoric pottery of various sizes, with ocasional arrow-heads, stone axes and other relics of a people at least a thousand years old.

This much of Santa Fe and surroundings from a scenic and prehistoric standpoint, al-

On the Scenic Highway

though half has not been enumerated, much less described, for lack of space. Its wealth in a historic sense has been indicated, but merely this. In the Old Palace in which Lew Wallace, then governor of New Mexico, wrote Ben Hur, there have been enacted many stirring events in the past three hundred years, and the Plaza which the Palace faces, could it but talk, would draw brilliant word pictures of happenings that in romance and in thrilling detail would eclipse the tales of the crusades. Bloodshed and martyrdom are within the scope of this story, as here centered the turbulent history of three hundred years of conquest. In the Old Palace is a museum containing the most noteworthy collection of southwestern antiquities and books outside of New York and Los Angeles.

Dominating the city, are the earthworks of Fort Marcy, and part way beneath its brow, are the ruined walls of the Garita, the old Spanish fort, custom house and place of execution. On every side are hoary landmarks: the Fonda, the terminus of the famous Santa Fe Trail, the Rosario chapel built in commemoration of the vow of De Vargas who reconquered the city from the Pueblos, ancient shrines, battlefields and historic spots, such as that marked by the monument designating where Governor Perez was assassinated less than a century past, or where Kearny addressed the populace after taking possession of the city only five decades ago. Tradition, folk lore and history intermingle as the old timer fondly points out the places where great or startling events occurred. Old Fort Marcy is situated on a high hill northeast of the Palace Hotel, and the view from the summit is universally admired. It is 291 feet above the Plaza. Historically it is a place of great interest, as a moment's observation will show, its commanding military position is such that the army in possession of the hill controlled the city. In the old wars this was the scene of many a warlike encampment, and when, in 1680, the Pueblo revolted against the Spanish rule, the hill was occupied by the Indian forces under Pope, on August 11, and the city besieged for nine days, when the Spaniards were forced to evacuate and retreat to El Paso.



Hon. Nathan Jaffa, Secretary of New Mexico

On the 16th of December, 1693, De Vargas re-entered Santa Fe, and encamped on this spot and remained until the day after Christmas, when the Spaniards drove the Taos Indians from the town, and re-occupied its houses.

When Gen. Kearney came in 1846, one of the first matters undertaken after the occupation of Santa Fe, on August 18, was the erection of a fortress to command the city. This site was naturally chosen, and Lieut. Gilmer and W. Mac Lean of the Missouri Volunteers were appointed to superintend the construction. It was built by details of Volunteers, who complained greviously of having to do this laborious work, when they had simply entered the

Court House Capitol Building Federal Building

army to fight. In shape the fort was an irregular tridecagon, large enough to contain a thousand troops and mount many cannon. It was named in honor of Hon. W. L. Marcy then Secretary of War; and the remains of its massive adobe walls are still of considerable height.

The Governor's Palace is of unfailing interest, with its walls six feet in thickness, and its narrow prisons of the Spanish era. Without disparaging the importance of any of the cherished historical localities of the East, it may be truthfully said that this ancient palace surpasses in historic interest and value any other place or object in the United States. It antedates the settlement of Jamestown by at least two years, and that of Plymouth by fifteen, and has stood during the three centuries since its erection, not as a cold rock or monument, with no claim upon the interest of humanity except the bare fact of its continued existence, but as the living center of everything of historic importance in the Southwest. Through all that long period, whether under Spanish, Pueblo, Mexican or American control, it has been the seat of power and authority. Whether the ruler was called viceroy, captain general, political chief, department commander, or governor, and whether he presided over a kingdom, a province, a department, or a Territory, this has been his official residence.

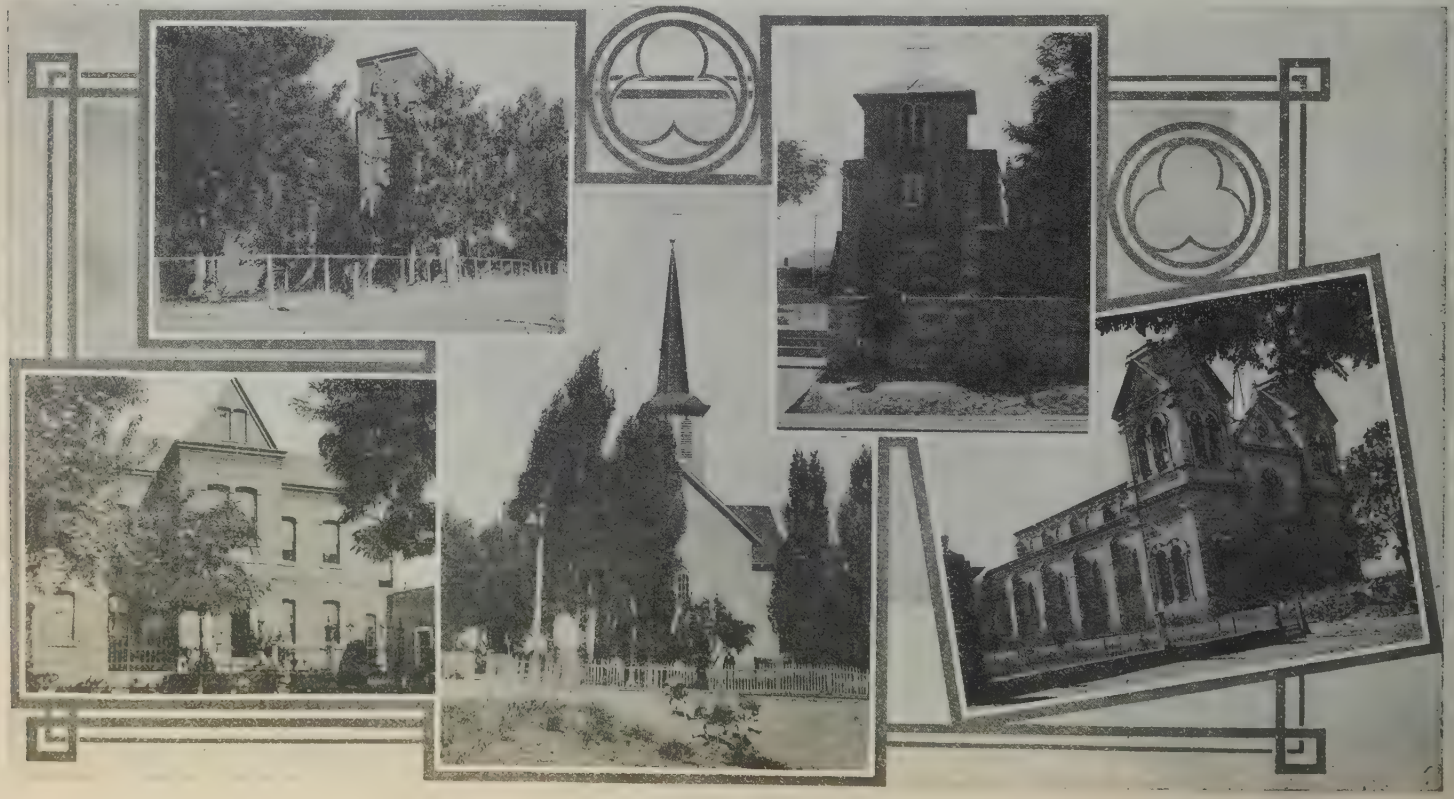
From here Onate started more than three hundred years ago on his adventurous expedition to the Eastern plains; here, a few years later, eight hundred Indians came from far-off Quivira to ask aid in their war with the Axtaos; from here, in 1618, Vin-

City of Santa Fe

Old Palace, 300 Years Old

cente de Saldivar set forth to the Moqui country, only to be turned back by rumors of the giants to be encountered; and from here Penalosa and his brilliant troop started according to his own account, on the 6th of March, 1662, on their marvelous expedition to the Missouri; in one of its strong rooms the commissary general of the Inquisition was imprisoned a few years later by the same Penalosa; within its walls, fortified as for a siege, the bravest of the Spaniards were massed in the revolution of 1680; here, on the 19th of August of that year, was given the order to execute forty-seven Pueblo prisoners in the plaza which faces the building; here, but a day later, was the sad war council held which determined on the evacuation of the city; here was the scene of triumph of the Pueblo chieftains as they ordered the destruction of the Spanish archives and the church ornaments in one grand conflagration; here De Vargas, on September 14, 1692, after the eleven hours combat of the preceding day, gave thanks to the Virgin Mary, to whose aid he attributed his triumphant capture of the city; here, more than a century later, on March 3, 1807, Lieutenant Pike was brought before Governor Alencaster as an invader of Spanish soil; here, in 1822, the Mexican standard, with its eagle and cactus, was raised in token that New Mexico was no longer a dependency of Spain; from here, on the 6th of August, 1837, Governor Perez started to subdue the insurrection in the North, only to return two days later and to meet his death on the 9th, near Agua Fria; here, on the succeeding day, Jose Gonzales, a Pueblo Indian of Taos, was installed as Governor of New Mexico, soon after to be executed by order of Armijo; here, in response to a fancied insult, Governor Martinez killed the head chief of the Utes at a single blow; here, in the principal reception room, on August 12, 1846, Captain Cooke, the American envoy, was received by Governor Armijo and sent back with a message of defiance; and here, five days later, General Kearney formally took possession of the city, and slept, after his long and weary march, on the carpeted earthen floor of the palace.

The Plaza is not only a place of beauty and refreshment, but of varied historic interest. Here Onate camped and set up the banner of Spain, and here General Kearney first floated the Stars and Stripes in 1846, when he proclaimed American Government

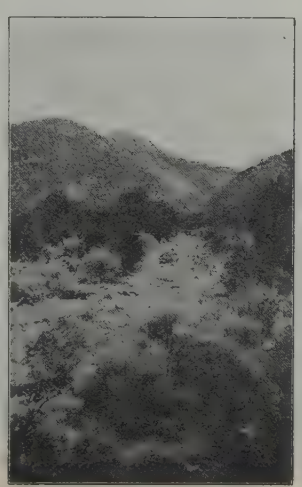


Churches in Santa Fe

Mary E. James Mission School | Deaf and Dumb Asylum | High School | First Ward School

in New Mexico, a spot marked with an appropriate stone by the Daughters of the American Revolution. In this Plaza the Indians burned the archives and sacred vessels of the Church during the revolution of 1680; and here De Vargas entered in triumph twelve years later. The Territory has erected a handsome monument in the center of the Plaza in memory of the soldiers who fell on New Mexico soil in the various Indian wars, and the war of the Rebellion, and the Woman's Board of Trade has there placed a handsome bronze drinking fountain in memory of Archbishop Lamy who was beloved by all. The Womans' Board of Trade has had charge of the Plaza for the past ten years, by direction of the City Government, and to this organization of energetic ladies is due the present beauty of the place.

Santa Fe has good reason to pride itself upon its climate. It has the most equable weather in the Southwest, the sunshiniest and the healthiest in the United States, not excepting any southwestern or Pacific Coast health resort. In 1907, the highest temperature recorded by the U. S. Weather Bureau at Santa Fe was 87 degrees and there was not a night in the year when the temperature exceeded 60 degrees. What such a cool summer with cool days and cooler nights means to the healthseeker only those who have sweltered in the humid Atlantic Coast or Middle Western states can appreciate. Nor do these cool summers mean cold winters. There was not a day on which the temperature in the sun did not exceed 30 degrees. In 1907, the lowest temperature recorded was five degrees above zero and that was during the night. The average precipitation is between 14 and 15 inches a year, enough for dry farming yet dry enough for the healthseeker. There were only 39 cloudy days last year that the weather bureau classified as cloudy. That does not mean 39 days without sun, but so many days on which the cloudiness exceeded the sunshine. Most of the cloudy days occur in summer still further tempering the moderate heat of the day. Month after month passes during which there is not a single day without sunshine, and sunshine in the southwest means a good deal more than in the moisture laden air of the sea levels. Coupled with it is a dry, rarefied air, antiseptic in the fullest sense of the term, an atmosphere bracing and healthgiving, and sunshine in which the bacteria of disease cannot live. Add to this, the odor and ozone from the pine and spruce of the vast forests which spread out in every direction, the exhiliration of a high altitude just right for the comfort and rapid recovery of the healthseeker, and the fact that in 1907, the maximum wind velocity recorded was only 38 miles an hour, and it must be acknowledged by the student of comparative meteorology that Santa Fe has the climate, par excellence, for the making of an all-the-year-round health resort, to which are added attractions and advantages of which any widely advertised tourist resort would be proud. For the accommodation of healthseekers, Santa Fe besides its five hotels, has Saint Vincent's Sanitarium, Sunmount Tent City, the Diaz Sanitarium, and one or two other tent sanitaria in addition to private boarding and rooming houses.



Scenic Highway

However, history, scenery and climate are but incidentals in the every day life of Santa Fe. It is the Capital of the Territory and has been the most important city of the Southwest for three hundred years. It commands commercially with its three railways and many wagon roads a trade area equaling a good sized kingdom. It is the county seat; also the see of an archbishop of the Roman Catholic church. Besides its Woman's Board of Trade it has a general Board of Trade and a Commercial Club; a beautiful Capitol, a Federal Building classic in its outline and substantial in its construction, a court house medieval in architecture, a Cathedral, Roman Catholic, Presbyterian, Protestant Episcopal and Methodist churches, the Mary James and the Allison Mission Schools of the Presbyterian church, one for boys and the other for girls; Saint Michael's College, the oldest college for boys west of the Missouri; Loretto Academy and Convent, the oldest young ladies' Seminary west of the Missouri; a splendid system of schools, of which the high school building is the finest public school structure in New Mexico. There are besides, the territorial penitentiary, the territorial deaf and dumb school, Saint Vincent's orphan's home, Saint Vincent's hospital, the Diaz hospital and Sanatorium. The United States Indian In-

Loretto Academy and Chapel

St. Catherine's Indian School

Allison Presbyterian Mission School

dustrial School having more than 300 pupils and Saint Catherine's Indian School, maintained by Miss Drexel in the Roman Catholic faith.

The Fraternal Associations are well represented in Santa Fe. The Masons own their temple, a two-story brick business block facing the Plaza. The Masonic bodies of the city are Montezuma Lodge No. 1, A. F. & A. M., the oldest Masonic Lodge west of the Missouri, excepting a Lodge at Salem, Oregon; Santa Fe Chapter No. 1, R. A. M.; Santa Fe Commandery No. 1, Knights Templar, and Santa Fe Lodge of Perfection, No. 1, A. & A. S. R. In the Masonic Temple are interesting relics of the early days of the American occupation, including the sword of Kit Carson, and among its members were many of the early pioneers who blazed the way for the thousands who came after them. The Odd Fellows, who organized a Lodge at Santa Fe over fifty years ago, are represented by Santa Fe Lodge No. 2; the knights of Pythias by Santa Fe Lodge No. 2, and the Fraternal Union by Santa Fe Lodge No. 259. In numbers, Santa Fe Lodge No. 460, B. P. O. E. is the strongest fraternal organization. The Order of United Workmen and other fraternal orders have Lodges in the city.

There are several social organizations, including the Capital City Club. The city has two brass bands, two orchestras, several Spanish and a number of church societies. It has the only National Cemetery in New Mexico or Arizona.

At the Federal land office, a drama is being quietly transacted at this very time which is more momentous in its consequences than the brilliant deeds of the Conquistadores. Here an average of thirty homestead land entries are being made daily, steadily reducing the area of 10,000,000 acres of public lands over which this office has control and filling up the fertile Estancia and other valleys tributary to Santa Fe. There are hundreds of thousands of acres immediately around Santa Fe still open to public land entry; as good land as is to be found anywhere. Santa Fe is also the headquarters of the Internal Revenue District for New Mexico and Arizona, of the Surveyor General, the Pueblo Indian Attorney, the Supervisor of the Pecos, Jemez and Taos Forest Reserves, the Federal Weather Bureau, the U. S. District Court, and other Federal official activities for the Territory. The municipality owns all the vacant lands of the Santa Fe Land Grant of thirty square miles.

Nor is the story of Santa Fe complete without speaking of its orchards, its gardens, its hospitable homes. The fruit raised here rivals that of California in size and color and far surpasses it in flavor. Nearby valleys, irrigated from mountain streams, are unexcelled in fertility. In every direction lead roads to scenes of impressive beauty or historic or archaeological interest. Peaks 13,000 feet high can be climbed easily over well worn trails, and snowfields are found in mid-summer. In every direction are forests and rivers and lakelets; mines a hundred years old or only discovered yesterday, from the Tiffany turquoise mines, fourteen miles to the south, and the ancient gold placers of the Ortiz Mountains, to the copper, mica and gold mines 20 to 50 miles north. Coal underlies the surrounding hills and clay of the best quality furnishes the material for brick so superior that they are exported four to five hundred miles into Mexico. In the jewelry shops the daintiest gold and silver filigree work is made, or rather spun, while in the surrounding pueblos, pottery of quaint design is manufactured. There is some weaving of blankets and baskets in these villages and other native handicraft of interest to the visitor.

On the Scenic Highway

Santa Fe is proud of its public library just completed by its Woman's Board of Trade, a body unique in the annals of civic advance-

Palace Hotel

Claire Hotel

ment. The building is of brick, built in Mission style and was constructed without contribution from the great library giver of the United States, something of which few public libraries of today can boast. The Woman's Board of Trade also looks after the Plaza and Fairview Cemetery, besides taking care of the indigent and doing other public spirited and civic work. Santa Fe has one daily paper, the New Mexican, founded in 1863, and by far the oldest newspaper of the Southwest; four weekly papers, two of them Spanish; two banks, telephone and telegraph connection with all the world, electric light plant and enterprising wholesale and retail establishments.

From all this it must be gathered that while Santa Fe is ancient, it is not sleepy; while it is a veritable Vale of Enchantment it is fully abreast of modern progress; that while it offers to the tourist the same things that attract thousands to distant climes and far away places it also has for him every modern comfort and accommodation and at prices so moderate that they make a visit to Santa Fe an economy, for the side trip from Lamy to Santa Fe is free to holders of tourists' tickets on the Santa Fe system, and there are no toll houses on the roads nor ticket boxes at the entrances to the sights so well worth seeing. Three railroad systems form a junction at Santa Fe, the Atchison, Topeka and Santa Fe, the Denver and Rio Grande and the New Mexico Central, the last named being a connecting link with the Rock Island and El Paso and Southwestern Systems. No tour of the West, no matter how brief or how long, is complete without seeing Santa Fe, and a visit to this historic City of the Holy Faith is a Southwestern tour in itself.

Residences in Santa Fe

The Homeseeker or Investor

WHO DESIRES TO INVESTIGATE REGARDING

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IRRIGATED OR UNIRRIGATED SHOULD GET INFORMATION FROM

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FERTILE SOIL, APPROVED BY SOIL EXPERTS AND FARMERS ALIKE.
AMPLE RAINFALL, ESPECIALLY IN GROWING MONTHS.
READY MARKET FOR ALL PRODUCTS AT GOOD PRICES.
MATCHLESS CLIMATE, HEALTHFUL AND INVIGORATING.
SCHOOL FACILITIES UNEXCELLED.

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FIRST NATIONAL BANK
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Las Vegas, New Mexico, the Meadow City

By GEORGE A. FLEMING, Secretary Commercial Club

THE City of Las Vegas, The Meadows, was so named by the early Spanish settlers on account of the table-lands or mesas which extend in three directions from the city. It is composed of three distinct parts, a city and a town of Las Vegas and a village, Upper Las Vegas. The town and city are separate corporations, though in reality one municipality.

The one particular thing which has made Las Vegas known for years throughout the length and breadth of the land is its incomparable climate, which, added to the magnificent mountain scenery available at her doors makes it an ideal place for rest and recreation.

Recently, however, the development of the Mesa land through the opening of the Las Vegas Grant (title to which, by a comparatively recent decision of the Supreme Court of the United States, has been vested in the town of Las Vegas) has opened up new possibilities of revenue and development for the community, not hitherto dreamed of. Settlers are flocking to this land in large numbers even though the movement has just begun.

The Las Vegas Land Grant contains nearly a half million acres and within its boundaries, in addition to the agricultural possibilities, are to be found all sorts of minerals, timber in great abundance, limestone, coal and marble.

Prior to the coming of the Santa Fe railroad in the year 1879, Las Vegas was one of the important stations on the overland stage route from the Missouri River to Santa Fe. and some of the buildings of that early day are still occupied as stores and residences in the older part of the town. With the coming of the railroad a portion of the business was shifted from the west to the east side of the Gallinas river, and the greater portion of the modern improvements have been made in close proximity to the railway.

The present estimated population of Las Vegas is 10,000, but the public utilities are in advance of many of the eastern cities of twice that population. The water supply is as pure as can be obtained anywhere, coming from perpetual springs and mountain snows far up the canyon of the Gallinas.

A combined street railway and electric light plant of the most modern construction and containing the most improved machinery that could be purchased, has been in operation for about two years, giving the very best service.

Many miles of cement sidewalks and street crossings have been completed within the last few years, making the many hundreds of beautiful homes which line the residence streets entirely accessible, regardless of weather conditions. Las Vegas prides herself upon her beautiful homes, verdant lawns and magnificent shade trees. It is also fortunate in having the Territorial Normal University housed in a handsome brown stone building, and four modern public school buildings of the most approved construction.

The following religious organizations are housed in their own buildings: Presbyterian, Episcopalian, Methodist, Baptist, Christian Scientist and Catholic, while several of the other demoninations have organizations and worship in rented quarters.

Las Vegas boasts of two clubs, the Commercial Club in the City, and the Las Vegas Club in the Town. Each has handsome quarters and carry on a work for the benefit of the city at all times. The division headquarters of The Atchison, Topeka & Santa Fe Railway Co., are located at Las Vegas.

There are two wool scouring mills, two flouring mills, a box factory, planing mill, machine shop and foundry, ice plant, brick plant, and a large lime kiln, in addition to numerous smaller enterprises. All of the limestone used by the sugar mills of the Arkansas Valley in Colorado is supplied from quarries in the Gallinas Canyon, operated by The Canyon Lime Company. This company employes regularly upwards of 150 men and is engaged in the manufacture and sale of lime in large quantities.

The city and town contain 4 banks, two National and two Territorial, with combined deposits as shown by the last quarterly statement of over $1,500,000.00.

Porvenir Lake

Considerable mining development is being carried on in the adjacent hills and mountains, in which good deposits of copper and other minerals have been discovered. This portion of the resources of the community awaits active development by investors, with the certain result that such development will pay large returns.

The sale of the mesa land is being actively pushed by numerous companies at the present time, several of whom operate private cars from Chicago and other points over the line of the Santa Fe, bringing homeseekers every two weeks in large numbers to inspect the lands upon the mesa. These lands have advanced in price during the past year from $7.50 to $15 per acre, with the prospect of a still greater advance during the coming 12 months. Newcomers of all descriptions are heartily welcomed and find genuine western hospitality awaiting their arrival.

The scenic attractions of the section adjoining this community can scarcely be touched upon in an article of this length, but as a visitor put it, who recently made a trip in an auto over the city and scenic highway, up the Gallinas Canyon, over the foothills to San Ignacio, thence to Rociada, thence up the Cebolla Valley and returning by way of La Cueva: "If the beauties of this trip could be known throughout the East, thousands of people, who at present pass through Las Vegas on the palatial trains of the Santa Fe Railroad on their way to California and the Grand Canyon of the Colorado in Arizona, would stop at Las Vegas and take this trip before completing their journey." He further stated: "It is greater than any trip I have taken in Colorado, greater than the boasted beauties of the Garden of the Gods or the trips around Manitou, and should not be overlooked by the lover of beautiful scenery, who can avail himself of the opportunity."

THE LAS VEGAS GRANT

The community of Las Vegas is the fortunate possessor of an heritage worth millions of dollars. This is the vast Las Vegas Land Grant, containing 437,000 acres, much of the land admirably suited to agriculture, part of it heavily timbered, other parts holding yet unknown value in immense deposits of the finest marble and building stone, copper, coal and other minerals.

Until the last year or two it was impossible to secure a complete and satisfactory title to the Las Vegas Grant, a fact that has operated to hinder the settlement and

Men who Do Things in Las Vegas

development of the promising areas surrounding the city and town. Now that all matters of title have been adjudicated, the infinite possibilities of the grant are being made known and development is going on with gratifying rapidity.

A word as to the history of the grant. As long ago as 1845 the splendid domain was granted by the government of Mexico to forty-five named grantees and others who desired a home within its borders. In 1860 the grant was confirmed by the Congress of the United States. After years of litigation as to the ownership, which carried many of the questions raised to the Supreme Court of the United States, on June 21, 1903, a United States patent was issued, confirming the lands to the town of Las Vegas. The District Court thereupon appointed a board of seven trustees to administer the business of the grant under court supervision. This action of the court was approved by an act of the Legislature, which designated the board as "The Board of Trustees of the Town of Las Vegas," and added legislative authority to that of the court in empowering the seven trustees to transact the business of and administer the grant.

The board of trustees had the whole grant surveyed and subdivided into sections and quarter sections and then announced itself ready to give title to the grant lands. The claims of settlers who had resided for a sufficient time upon the land and had made improvements thereon, were given the first consideration. Scores of settlers have presented their claims before the board and have received title to small holdings.

Probably 250,000 acres of unimproved land, far the greater part of it suitable for agriculture, remain to be disposed of. To the task of disposing of this land to the best advantage to the community the board is now addressing itself. With a view to demonstrating that abundant crops could be raised on the Mesa lands which stretch in sweeping undulations for many miles eastward from Las Vegas, by the employment of rational methods of farming, the board, in the summer of 1906, presented the Campbell System Dry Farming Association with 640 acres of land. The land was conveyed too late to admit of crops being planted that season, but a number of other farmers planted crops of wheat and corn and oats and secured bounteous returns. Large areas were sown to winter wheat in the fall and at present the promise of a heavy yield is excellent.

Fifty thousand acres of land, just east of Las Vegas, has been placed on the market and is being rapidly sold. As soon as this tract has been disposed of another large block will be offered to the public.

The soil has been pronounced by experts of the New Mexico College of Agriculture almost ideal for farming. Steam plows and other machinery needed to successfully farm large areas have already been purchased and it is confidently anticipated that the approaching harvest season of 1908 will see the green plains, which have given the city its name, covered with waving grain and fruitful fields of vegetables. While it is the intention of the farmers who are developing the lands to employ scientific methods suitable to the cultivation of semi-arid lands, yet with the rain and snow fall of this region at its average, almost any method appears to be sufficient to encourage the deep rich soil of these plains to yield abundantly.

In depth and quantity of soil, in the openness of the land, in the abundance of

The Plaza **Bridge Street**

Plaza Trust Bank San Miguel Bank First National Bank

rainfall, no part of New Mexico can surpass the Mesa lands east of Las Vegas for farming without irrigation. The purpose of the grant trustees being to bring in farmers rather than profit by the income derived from the sale of the land. The opportunity for homeseekers is unusually good.

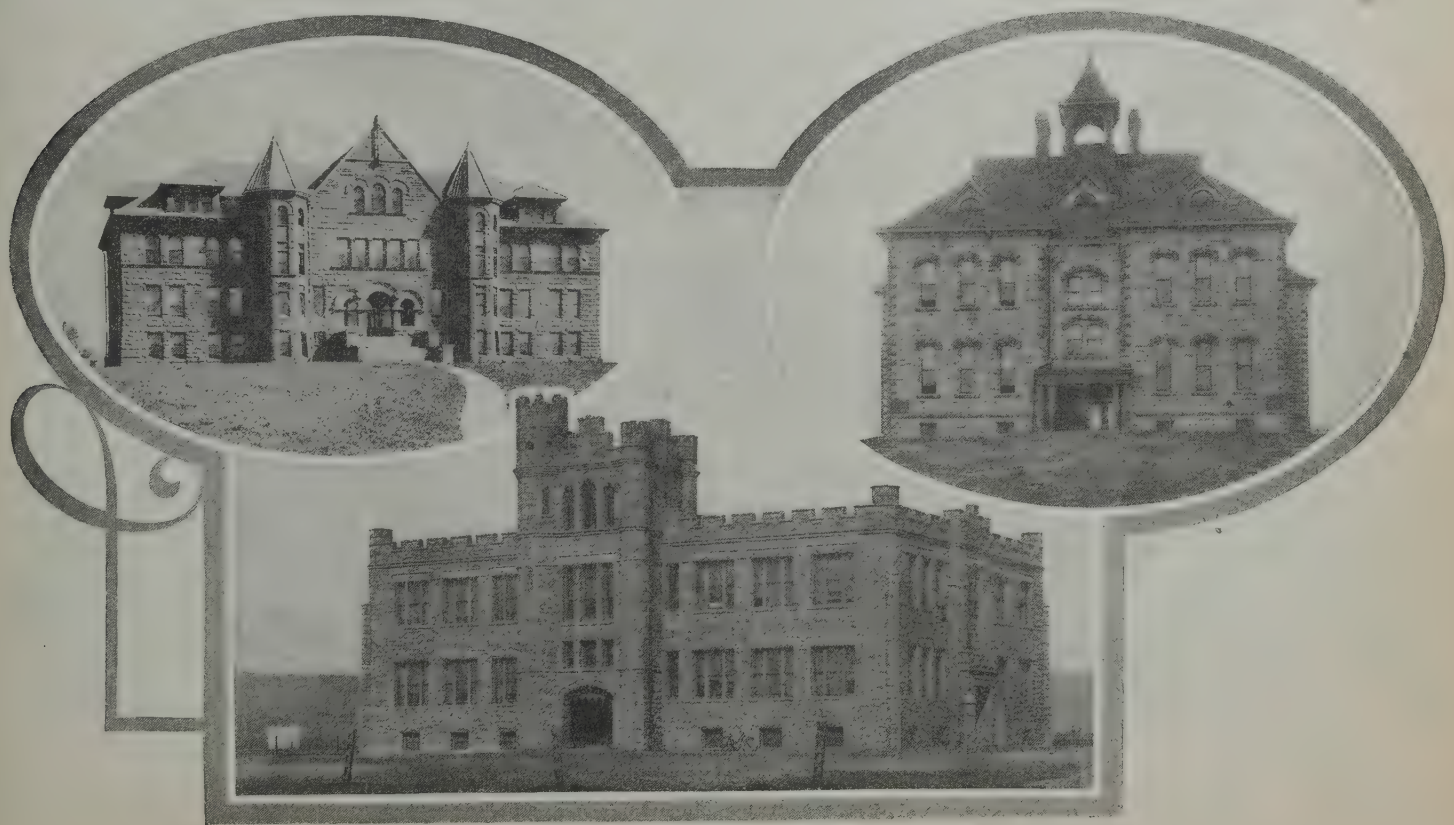
The board of trustees warrants the title to the lands sold.

While it is not the first object of the board to derive an income from the sale of grant lands, yet the disposition of 250,000 acres is certain to bring in a large sum of money. To what end this money will be expended has not yet been decided, but whether it be for the betterment of the public schools on the grant, the improvement of roads, the lowering of taxes or for all of these objects, the effect upon the prosperity of the grant community cannot fail to be pronounced. Both the city and town of Las Vegas are upon the grant and will share the benefits that result from the expenditure of the income.

The grant board as originally appointed and as still constituted is composed of the following well known men: Jefferson Raynolds, President of the First National Bank of Las Vegas, President; Elisha V. Long, former Chief Justice of New Mexico, Secretary; Eugenio Romero, Charles Ilfeld, Jose Felix Esquibel, Frederick H. Pierce, Isidor Gallegos.

PRICE OF LAND

The land is sold at a moderate price to suit each purchaser and considering the perfect title, free from all red tape exactions of the Federal Land Deparement, and the fact that the day you pay for your land you get your title almost straight from the Supreme Court of the United States, it is by far a much better proposition to the in-



Normal University High School Ward School

Mesa Farms

tending settler than to take up government land and pay almost the same price in the end.

"DRY" FARMING

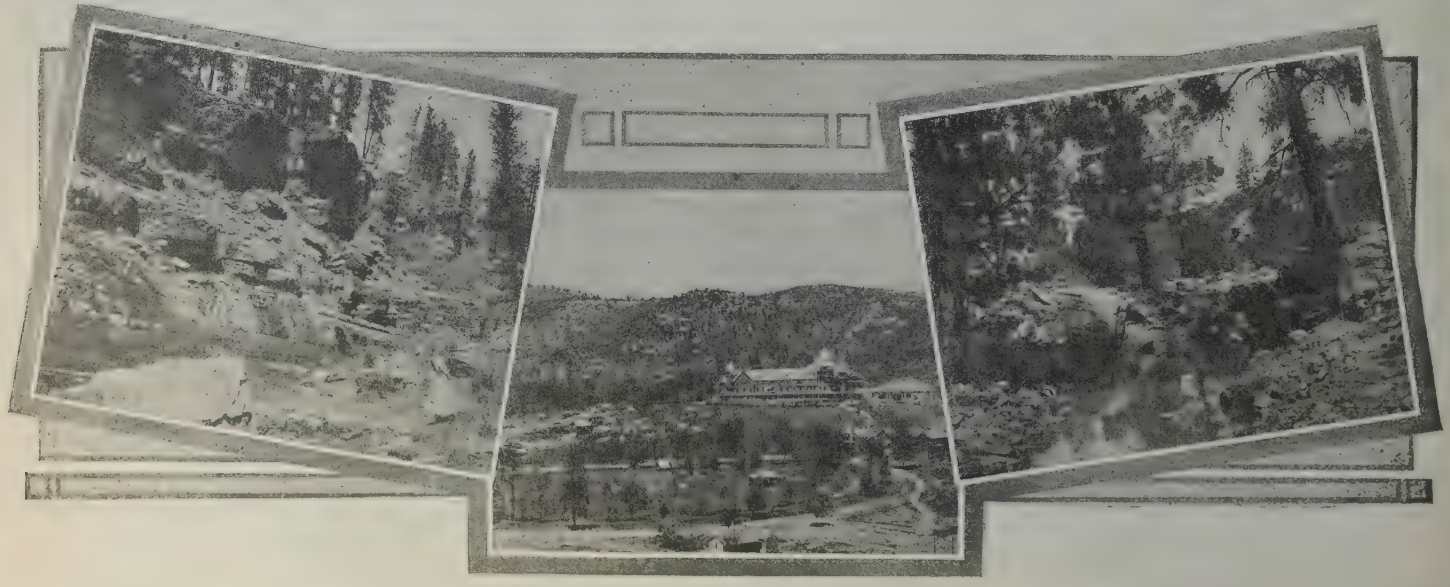
During the last year or more there has been much said concerning so-called dry farming in San Miguel County. "Dry farming" is hardly the phrase to apply, when it is remembered that at Las Vegas the average annual precipitation is 19 inches, and 80 per cent of this precipitation falls during the growing months from April to October. In the higher regions of the county the rainfall is considerably more than in Las Vegas.

For scores of years in various parts of the county, temporal crops have been grown in abundance with scarcely a failure. The soil has merely been stirred to a depth of 2 or 3 inches and the corn, oats or beans planted and left to mature or fail, little or no attempt to encourage their growth being made. The uniformity with which such crops have reached an abundant harvest, year after year, makes it appear the more remarkable that the acreage under cultivation is not much greater than it is. The fact previously alluded to that hundreds of thousands of acres nearest the city are included in the Las Vegas grant, is probably largely accountable.

Such successful farmers as George W. Ward, W. H. Comstock and Dr. F. E. Olney have for years planted crops which have come to bountiful maturity without irrigation and have never known a failure. These practical farmers have employed rational farming methods, but have not resorted to what is known as the dry farming system of deep plowing and sub-surface cultivation. It is the intention of the farmers who are taking up the lands eastward from the city to utilize the Campbell dry farming methods and there can be no doubt but the employment of such methods will increase the productiveness of the soil, as well as secure the success of the crops, should any year's rainfall come much below the average. Since the records of the weather bureau have been kept, only one year has brought a drought and then the precipitation fell to a little above nine inches.

Wheat, oats, corn, beans, peas, celery and all kinds of vegetables have been the staple crops, but it is the intention also to introduce kaffir corn, milo maize, sorghum, field peas, Durum wheat and a variety of the dry farming crops.

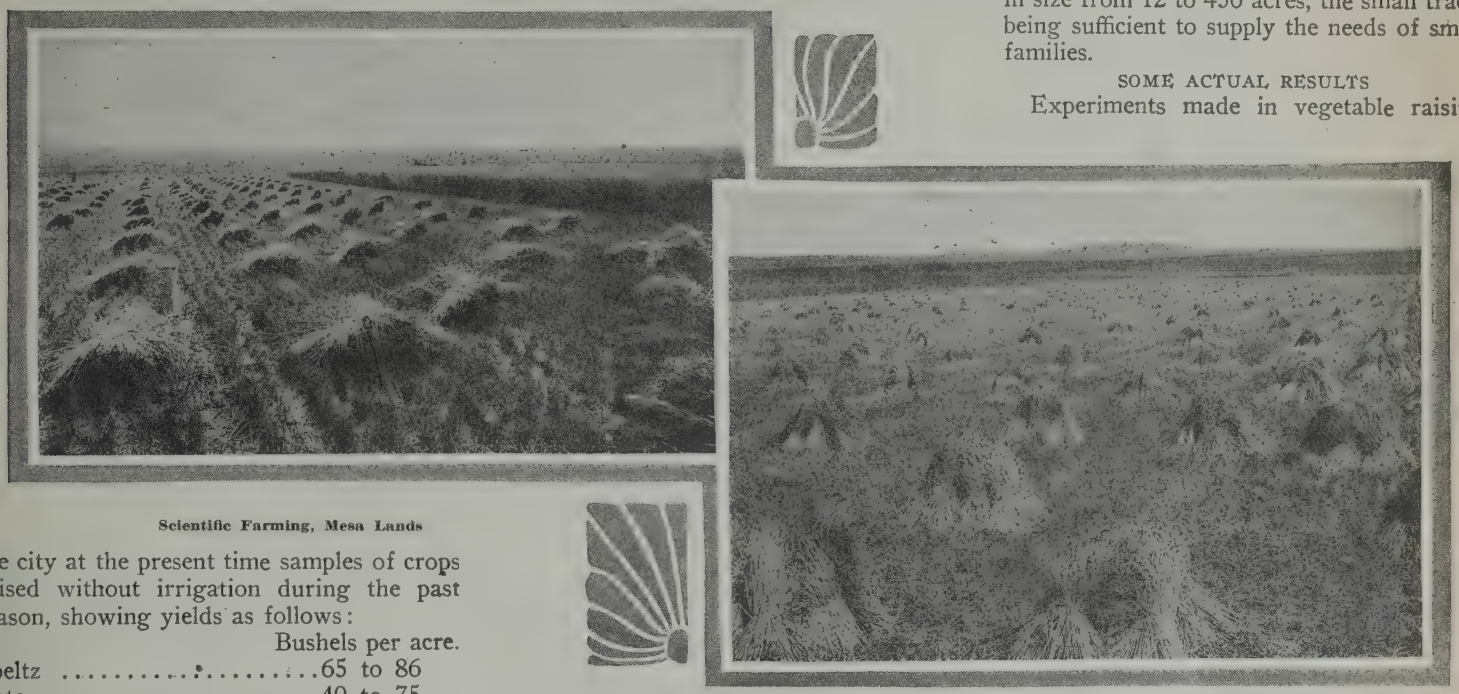
Water is to be obtained in abundance on the Mesa land at a depth of from 15 to 40 feet. The market for all kinds of crops raised here is large and increasing. Far the largest part of the food stuffs consumed in Las Vegas and surrounding country is now imported and it will be years before the home demand can be supplied. The wheat raised in this region makes excellent flour. Already several flouring mills have been established. The raising of winter wheat



Montezuma Hotel and Nearby Beauty Spots

for home manufacture promises to become a leading industry. The soil is also finely adapted to the culture of sugar beets. It is the intention of a number of farmers already interested in the Mesa lands to devote a large acreage to this vegetable. A beet sugar factory is promised if the enterprise is carried out. The west does not afford elsewhere so large an arear of rich unimproved farming lands so closely adjacent to ready markets. There are on exhibition in lawyers, doctors, politicians, middlemen, statesmen, etc., the supply is fully equal to the demand; but the farmer, the basis of development, and the foundation stone and superstructure of all public prosperity, individual, local, State and National—the man who tills the toil in rational, intelligent and successful ways is the man needed here.

The native population of the county are natural sheepmen and cattlemen and devote most of their attention to these profitable in-



Scientific Farming, Mesa Lands

the city at the present time samples of crops raised without irrigation during the past season, showing yields as follows:

	Bushels per acre.
Speltz	65 to 86
Oats	40 to 75
Macaroni Wheat	25 to 40
Marvel Spring Wheat	25 to 40
	Tons per acre.
Alfalfa	2 to 4
Oats cut for hay	3 to 5

To summarize briefly: Where can be found a tract of land with wonderfully productive soil and rainfall, adequate if not abundant, building material of all kinds at its very doors, fuel in ample quantities, a superb climate conducive to the best of health, and above everything a market immediately at hand at prices considerably higher than those of the eastern markets. Such are the conditions that exist with regard to the land to be cultivated by the scientific farming methods.

While the dry or scientific method of farming is comparatively new, it has been demonstrated to the satisfaction of the average western farmer that it is entirely practical and has come to stay. Yet in many of the valleys of the County abundance of water can be obtained from the streams for farming under the ancient and established method of irrigation and in this connection the following facts will be of interest:

For more years than the oldest inhabitant can remember, irrigation has been successfully practiced in San Miguel County. Whether the waters of the Rio Gallinas, the Rio Sapello, the Rio Pecos, the Rio Tecolote or the other streams in the county have been utilized, unfailing crops have been raised. But the greatest of all needs in San Miguel County is farmers. Of merchants, dustries. In many instances they have their homes located in rich valleys capable of producing large and paying crops, but at the same time import their corn and flour from the Middle States.

In San Miguel county, the above mentioned valleys have ample water, if intelligently used, to supply wheat, oats, corn and hay to a population of 200,000 people, yet for a lack of farmers, there are on an average twelve carloads of flour, three of corn and five of oats shipped into the county per month the year round. This is the natural result of the condition of our industries. The cattle and sheepmen are not producers of hay, grain and fruits, nor do they even raise garden truck, but they buy oats by the ton, and they buy bacon, garden products and fruit. The miners who delve for copper, coal, silver and gold are many and they buy imported products at good prices; and yet it has been repeatedly demonstrated that agriculture on almost any scale will pay handsome returns.

Three and four cuttings of alfalfa can be secured, orchards flourish mightily and gardens are nowhere in the world more productive.

The Gallinas Canal & Water Storage & Irrigation Co., capitalized at $10,000, furnishes a startling object lesson of the feasibility of reclaiming land by simple irrigation methods. A main ditch is conducted three miles out from the Gallinas river supplying a natural reservoir covering 34 acres of ground. From this reservoir by ditches and laterals, water is conveyed to the several farms lining the system, each having a private reservoir which is fed from the river in the flood season and which is capable of irrigating its respective tract two or three times during the dry season. Under this system about 1500 acres of waterless uplands have been reclaimed for agriculture. The farms watered in this manner adjoin the city of Las Vegas and vary in size from 12 to 450 acres, the small tracts being sufficient to supply the needs of small families.

SOME ACTUAL RESULTS

Experiments made in vegetable raising have been prolific of as good results as those of producing grain. One year's crop of vegetables on less than six acres of ground resulted in 11,183 pounds of beets, 46,537 pounds of cabbage, 2960 pounds of carrots, 2,800 pounds of parsnips, 226 pounds of onions, 1,022 pounds of cauliflower, 1,049 pounds of turnips, 184 pounds of string beans, 836 pounds of cucumbers, 10 pounds of lettuce, 21 pounds of Jaga, 40 pounds of green peas, 600 roasting ears of corn, 100 pounds of rhubarb, 600 pounds of celery, 26 pounds of beans, 2,186 pounds of corn in the ear, 3,000 pounds of oats in sheaves, 5,600 pounds of shock fodder, a total of 81,800 pounds of product valued at $2,050. This from six acres of ground, which a short time before had been a barren hillside.

Beets weighing 14 pounds, cabbages 36, and turnips 4, were common features of the crop. From one ounce of seed 1,000 pounds of sugar beets were raised. Celery weighing four pounds to the stalk and a dozen bunches weighing as much as five dozen of the Kalamazoo product, four cabbages weighing 137 pounds, two more weighing 75 pounds, and sugar beets planted June 1st, and tested in January, which gave 15 per cent sugar and 87.4 per cent purity, were the results of another practical gardener's experiments. Potatoes in the higher mountain valleys give, without irrigation, a yield unexcelled in quality, size and quantity by any country in the world.

As an evidence of the remunerative fea-

Carnegie Library St. Anthony's Sanitarium Y. M. C. A. Building

tures of farming and gardening in this country, it may be said that eastern prices with a high freight rate added, prevail for the reason that the home products have never been sufficient to make any impression on the market and as there is no competition, freight and express rates are maintained as high as possible. Nearly all of the eggs and poultry used in the county are imported. The price of eggs is 35 cents per dozen and home ranch eggs command even a higher price. This rate is maintained the year round, for there is no diminution of the demand. Everything possible for the farmer to grow commands one-third more than the same product in the East, and market exists at home for all that can be produced.

GOVERNMENT RESERVOIR

The Government of the United States, through the Reclamation Service, has reserved a site for a reservoir where the waters of the Gallinas and Sapello may be diverted into a natural basin in the hills, about 3 miles north of Las Vegas. When this reservoir is constructed it will store water sufficient for the irrigation of at least 10,000 acres of land.

The land thus to be brought under cultivation is capable of raising any crop known to the temperate zone. It is a part of the Las Vegas Grant, and while a large portion of the acreage to be served with water has already been signed for, still there is room for many more settlers under the system as it will be the policy to have the land taken up in small tracts of 40 to 80 acres, it being estimated that 40 acres of this land properly and systematically farmed will be enough for the ordinary farmer to successfully manage. In the construction of the reservoir there will be no engineering obstacles to overcome, no unusual situations to meet. All that is necessary is the appropriation of sufficient money out of the Reclamation fund.

The reservoir will be a reservoir pure and simple, as it will store up the flood waters of the two streams named, and as they head in the snow capped mountains where storms are frequent, there will be no possible chance for failure on account of lack of water. There will be enough and to spare as has been proven by the government engineers who have maintained water measuring stations in both streams for several years.

In the mountains contiguous to Las Vegas are encountered millions of feet of the best lumber in New Mexico. Forests of yellow and white pine cover the mountains to their very tops, while spruce, cedar and fir supply any grade suitable for piling and bridge work in almost limitless extent. Close to the city are a great many saw mills whose daily output, while great, has apparently made no visible impression upon the supply.

The public schools of the city and town of Las Vegas are a source of great satisfaction to the residents in the community as they compare favorably with the best public schools in the East. Las Vegas is an incorporated city and has but one school district under the management of a board of trustees. Las Vegas proper has two school districts, whose destinies are looked after by various school directors. The directors availed themselves of the law of

Mouth of Gallinas Canyon

1890 and voted school bonds for the erection of more school buildings, each district now having a three-story, white sandstone edifice adequate to accommodate a city twice the population of Las Vegas ,and handsome enough to grace any community in the United States. The buildings cost $12,000 and $14,500 respectively. The average enrollment of pupils is 300.

The city of Las Vegas possesses the distinction of being the first community in New Mexico to erect a public school building by a special tax voted by the people. In 1889 the town council, in the absence of a law permitting the issue of bonds by school districts, built a schoolhouse under the general law permitting incorporated towns to issue bonds for public buildings. The school house was originally erected of white sandstone at a cost of $14,500 and during the past year it has been enlarged commensurate with the needs of the city, and the value of the property enhanced fully $10,000. This building now accommodates the first, second, third, fourth and fifth grades; the sixth, seventh and eighth grades and the high school being taught in the new building erected for high school purposes. This building was completed and first occupied in September, 1902, the cost of same being $25,000. It is constructed of brown sandstone, in the baronial style, and its size and beauty have received the favorable comment of many visitors. These school buildings offer ample accommodations to all children of the city. The course of study in the high school is of four years duration. Pupils from it have entered corresponding grades in high schools in the East, often obtaining advanced standing.

The New Mexico Normal University, which commands an eminence in the center of the city of Las Vegas, is a source of great pride to the Territory, as well as the city. It was created by legislative act in 1893 as a Normal school, and has since attained the dignity of a university by reason of its superior faculty and because of the earnest efforts put forth in behalf of the institution by the board of regents. For a period of four years the regents wisely husbanded the accumulating funds and were finally enabled,

Agua Pura Company

with the assistance of a number of public spirited citizens, to erect a building at a cost of $50,000, which is in every way adapted to the purposes designed. The university building is conceded to be the most beautiful public building in New Mexico. It is a three-story structure, built of red sandstone, produced by the Las Vegas quarries, and above the third story is a commodious attic, divided into two large and amply lighted rooms which will be utilized for a museum and gymnasium. The assembly room of the university has a seating capacity of 400 and the institution has equipment and room for the accommodation of 400 pupils. As to furnishings, the building is fitted with every known modern convenience, being heated with steam and scientifically ventilated. Electric lights, an excellent water system and sanitary plumbing insure ideal conditions for the school. The institution is served with a faculty of six professors and six teachers.

Persons having children to educate and who contemplate coming to this region for health or investment need have no fear that inferior advantages will be provided. The legal school age is from 5 to 21 years, inclusive, but the average attendance is practically from 7 to 17.

RESORTS

In the way of health and pleasure resorts Las Vegas is unrivaled. In a radius of 20 miles in romantic mountain glens and beside babbling mountain brooks, are the Las Vegas Hot Springs, Harvey's, El Porvenir, Blake's, Spark's, Sapello, Rociada and other places too numerous to mention, where health can be recovered and life becomes a pleasure to the ennuye, the invalid, the overworked business man.

The Las Vegas Hot Springs are located six miles from town, and are connected with the city by rail. The Montezuma Hotel, owned by The Atchison, Topeka & Santa Fe Railway Co., is a palatial, fire-proof

San Miguel County Court House

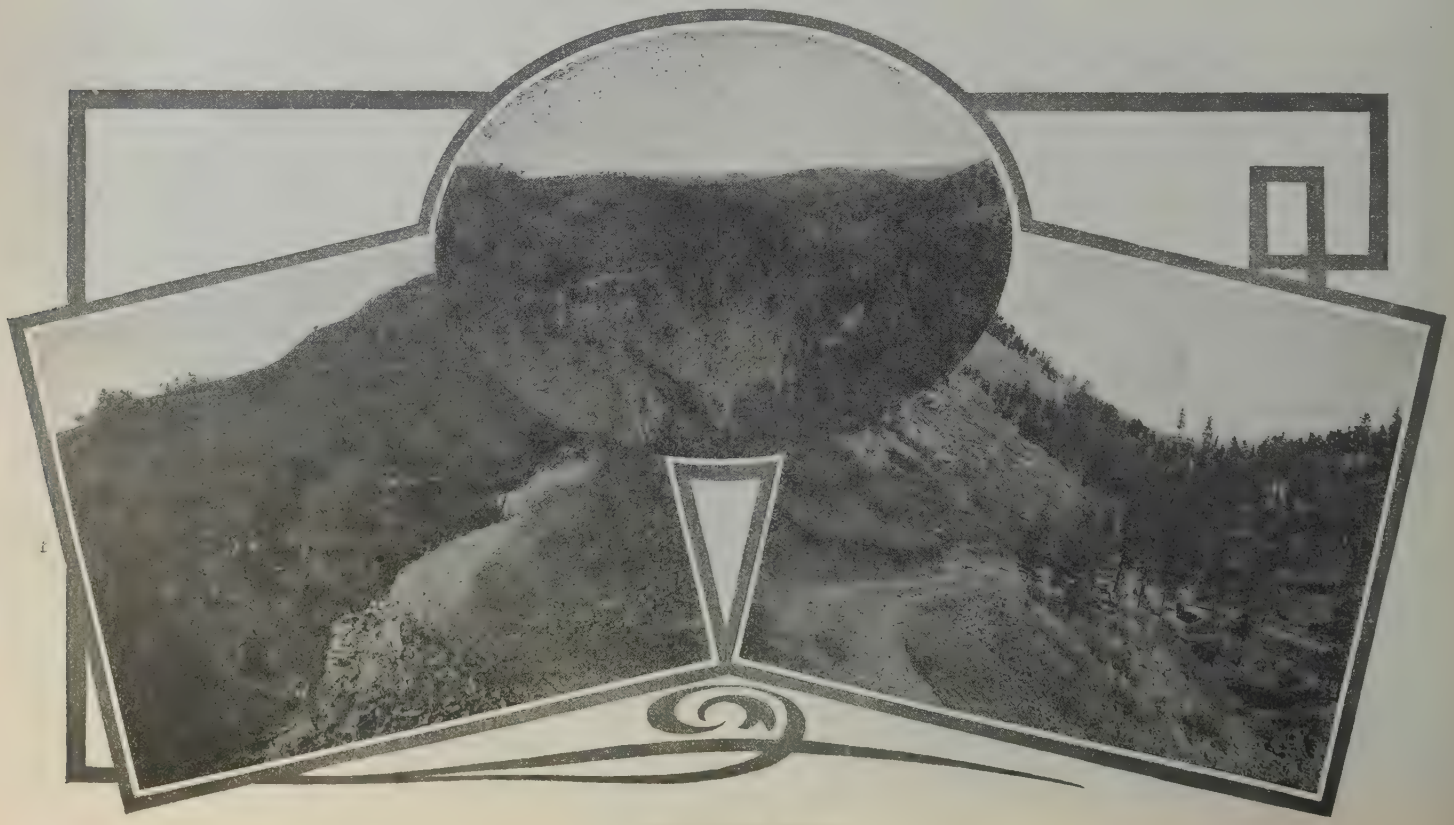
Las Vegas Light & Power Company Power House

Trout Springs and Harvey Ranch

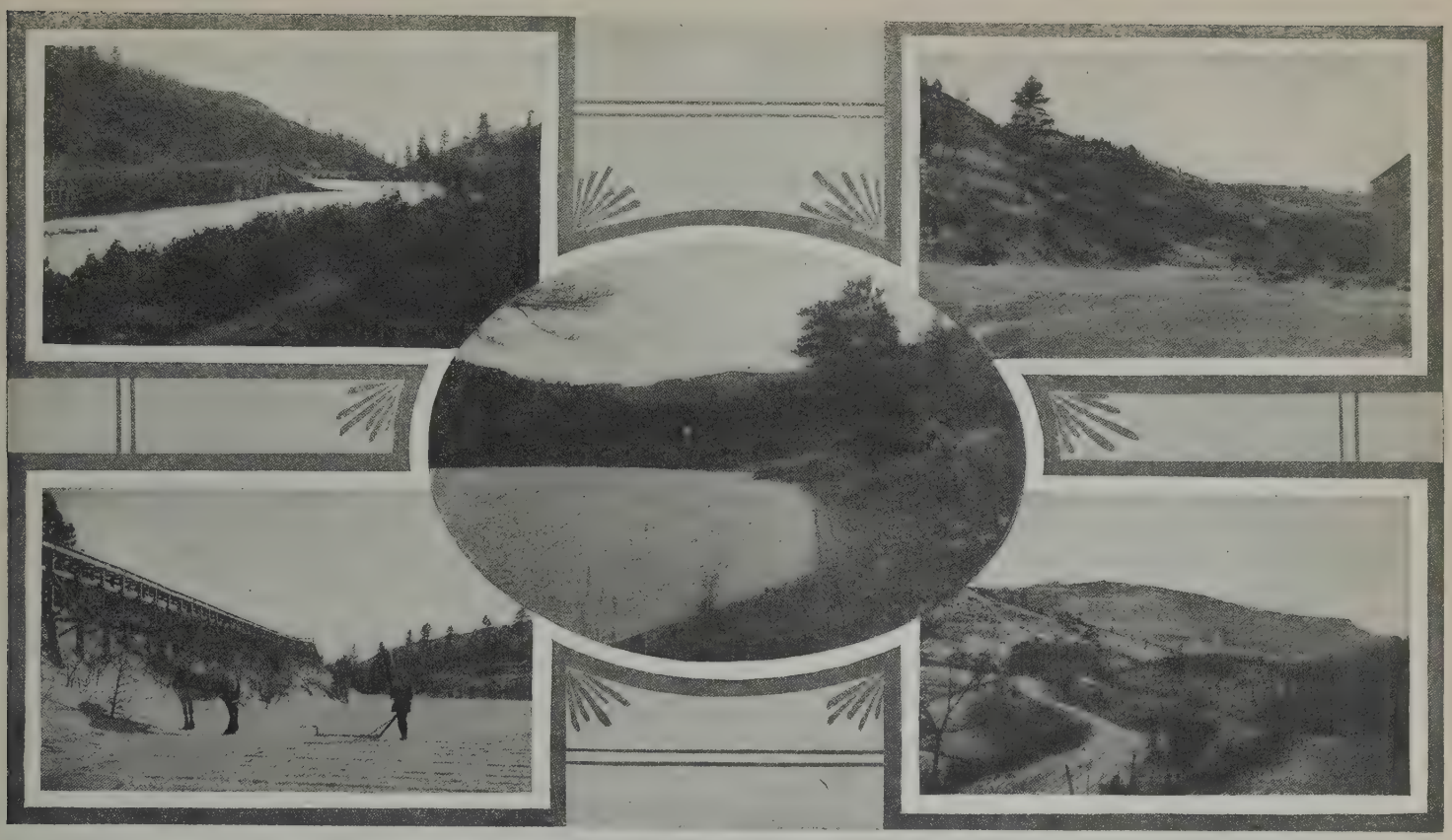
structure of red sandstone and slate, Queen Anne style, with several hundred rooms, and erected at a cost of $250,000. The other buildings are numerous, consisting of cottages and annexes, bath houses, hospital, postoffice, casino, station house, school house, telegraph and express offices, livery barn, etc. There is also the mountain house with sun parlor attached, a stone structure of 60 rooms. The park and grounds cover 500 acres, while the veranda on three sides of the Montezuma is 540 feet long and 15 feet wide. It is positively asserted that no place in the United States equals the Montezuma property for the establishment of a government military or naval sanatorium for invalid soldiers returning from the tropic island possessions. The buildings, the grounds, the locality and the climate are incomparable.

El Porvenir, a charmingly situated resort, has an elevation of 7,600 feet and is reached from Las Vegas by a 16 mile drive over the new Scenic Route, 10 miles of which lie through the Gallinas Canyon, every turn of which unfolds a new scene of inspiring beauty and grandeur. Hermit's Peak rears its rugged head near by, the two hour's climb to the summit revealing a panorama of mountain, canyon and plain unequalled in this section. Excellent hunting and fishing can be had near the hotel, while the deep unruffled blue of the sky, the dry invigorating air, the primeval pine forests with their balsamic odors and ceaseless sounds unite to make an ideal resort. Pleasure and health seekers are cared for in cottages, and tents if desired.

Harvey's Mountain Home is probably the



Views on Scenic Highway



Scenes in Gallinas Canyon

highest cultivated point in this county, having an altitude of 10,000 feet. This makes it an unsurpassed resort for summer visitors, whom Mr. Harvey conveys to and from the city, arriving each Friday and leaving on Saturday. Every comfort of country life is provided on this ranch, while the visitor can fish, or hunt turkey, deer, bear, mountain lion, wolves and other game to his or her heart's content.

Skating on Gallinas Lake

In addition to the resorts above described may be mentioned Buena Vista ranch, 4 miles from Las Vegas; Romero Ranch Resort, 4 miles south of Las Vegas; Trout Springs, 10 miles; Mineral Hill, 20 miles; Sandoval's summer resort, 16 miles; J. Y. Lujan's, 12 miles; Cutler's, Barkers and Blake's, four excellent places near Rociada. These and many others furnish sufficient changes to occupy summer and fall without the visitor ever becoming weary. Places to visit or camp, convenient to the city are Hermit's Peak, Gallinas Canyon, Kearney's Gap, Wild Cat Peak, Lower Gallinas Canyon, Bonito Canyon, Las Valles and the summit of the range where snow always lies and the view sweeps over New Mexico into Colorado, Arizona and Texas. The Pecos National Park, set apart by the government to be preserved in a state of nature, is of easy access from this city and when once seen will never be forgotten.

A NATURAL SANITARIUM

Las Vegas is the natural sanitarium of the United States, combining more natural advantages than any other place in America. Its thermal waters are the equal of the Hot Springs of Arkansas, while its climate is infinitely superior. There is no malaria, no excessive heat or cold, no gnats nor mosquitoes, no tarantulas, no spiders, no toads, no snakes, no rats. The air is pure, dry, rarified and highly electrified—a certain cure for liver, skin, rheumatism and blood disorders.

NEW MEXICO HOSPITAL FOR THE INSANE

The New Mexico Insane Asylum, a thoroughly modern and equipped hospital for the insane, is most beautifully situated on the Hot Springs Boulevard at the foot of the hills about two miles northwest of Las Vegas.

The original building of white stone, three stories high, was built in 1891 and contains 30 rooms with three large glass enclosed sun rooms on the end. This building is used exclusively for the offices of the superintendent and steward, drug and store rooms and sleeping apartments of the various employes of the institution.

The first addition was built in 1899 of red brick and contains 35 beds to the floor or a total of 105 for this building. The rooms are large enough for a single iron bed, dresser and chair with the exception of two dormitories on each floor of five beds each.

The second addition was built in 1903 and has 59 beds to the floor or 177 in this building, also of red brick, with two dormitories of 8 beds to the floor.

The capacity of the institution without crowding is about 200 patients and at the present time has 160 inmates.

These buildings are all fitted with modern appliances, plumbing and heating, comforts

Las Vegas Business House

for the sick, and conveniences for the attendants insofar as so young an institution with limited means is able, the cost of the erection and improvements to date being about $118,260.44. This includes a laundry well equipped with modern machinery. A reservoir lined with cement, is situated on the adjacent hill with a capacity of 5,000 gallons of water, which is pumped from a well on the premises about 40 feet deep; also a spiral fire escape, making it an easy matter to remove the patients without delay, should occasion demand.

The buildings are surrounded by 600 shade trees, maple, cottonwood, box elder, silver maple and Carolina poplar; the silver maple having proved the most successful growth for the length of time since planting.

In the summer the lawn is beautiful and carnations, sweet peas, dahlias and other flowers in abundance make it a most attractive place.

The original amount of land owned by the institution was five acres, but the directors have added to this from time to time and now have 312 acres. One hundred twenty-five acres are now under cultivation as a farm and garden. The remainder is used for pasture at the present time. 50 acres of the 125 are in alfalfa, the rest is devoted to garden and orchard.

In the Gallinas Canyon are to be found the nine beautiful lakes of the Agua Pura Company yielding an immense ice product not expected to be found in this land of warm and sunny winter days. But the winter nights in this elevated canyon near Las Vegas are extremely cold and sheer southern walls rise so steeply above the stream that the slanting sun in all its course has scarce a chance to peep over the ramparts at the busy ice cutters, or, perchance it may be the merry skaters disporting themselves on the ice below.

It is a fact that 50,000 tons of pure crystal ice are taken from these lakes each winter. The astonishment of strangers who arrive or pass through Las Vegas on a sunny December day when wraps are a burden, to see young people walking about with skates in their hands is frequently ludicrous.

Las Vegas, with its long streets of lovely homes and residences, its verdant lawns and nodding trees, is often called "The city of homes." Its homes are a source of pride, but the city has its substantial business advantages as well. East Las Vegas has two National banks, among the strongest in the Southwest, also an Investment Company which does a large business, and two first class building and loan associations. The town of Las Vegas has the Plaza Trust & Savings Bank, and a building and loan association. In both city and town are large and important wholesale houses which transact business throughout the entire Territory. The retail stores are fully equal to the best western standards. A comparatively populous surrounding country brings its trade to Las Vegas.

In addition to the fine Castaneda Hotel, Las Vegas has the following good hotels in addition to numerous smaller hostelries and rooming houses: The La Pension, Rawlins House, El Dorado, Albert and New Optic. As a result of the unparalleled climate sanataria are numerous. The most important are the Plaza Sanitarium in the town, St. Anthony's in the city, the Beautiful Romero Ranch Resort, five miles south of the city and the Mesa Ranch, two miles east.

Scenes on Scenic Highway

Raton, the Gate City of New Mexico

A Modern, Progressive City, the Metropolis of Northern New Mexico, Center of the Greatest Coal Belt in the West, Not a Boom Town, but a Substantial City of 8,000 People, County Seat of Colfax County Modern Schools and Churches and Strong Banks

THE history of Raton, the Gate City of Northern New Mexico, and one of the most aggressive in the Southwest, is confined comparatively speaking, to a very few years, yet the progress has been so remarkable that one must needs wonder at the energy, enterprise and determination which has been the cause of it all. It is but the story of American push and indomitable energy that is told in the Raton of today.

When the Santa Fe Railroad, that advance agent of prosperity, laid its rails through the Raton Pass in the spring of 1879, (the first to penetrate this practically undeveloped country), the only sign of habitation on what is now a part of the original townsite of this now bustling city, was the Willow Springs ranch, presided over by one William Boggs, whose ranch house was used as a stopping place and tavern by the ranchmen who had come into this section as they journeyed to and fro over the old Santa Fe Trail. It was about this time that George F. Pace, then a young man, following the advice of Horace Greeley to go west, stopped at the Boggs ranch and opened up a small general store. The railroad pushed on to Otero, five miles southward, where a settlement sprung up like a mushroom. It was the terminus of the railroad for about a year and was a typical frontier town, where scenes familiar to the strenuous open border were daily enacted. In the fall of 1881 the railroad builders started to extend the rails further southward which was the signal for an exodus of the inhabitants who moved their worldly belongings and the business men their stocks of merchandise to what is now the town-site of Raton. The settlement steadily grew with the influx of people. The adobe dwellings and log houses of the pioneer gave way to more substantial and enduring ones. The growth was slow but substantial. The establishment of division headquarters and the building of the railroad shops in 1880 gave an impetus to its growth. Far seeing citizens realized that Raton was coming into its own. Then came the development of the coal fields lying at her doors and an era of railroad construction tapping the coal fields and providing additional outlets for the product. Coal is King in Raton and Colfax County, the backbone of her present and future prosperity.

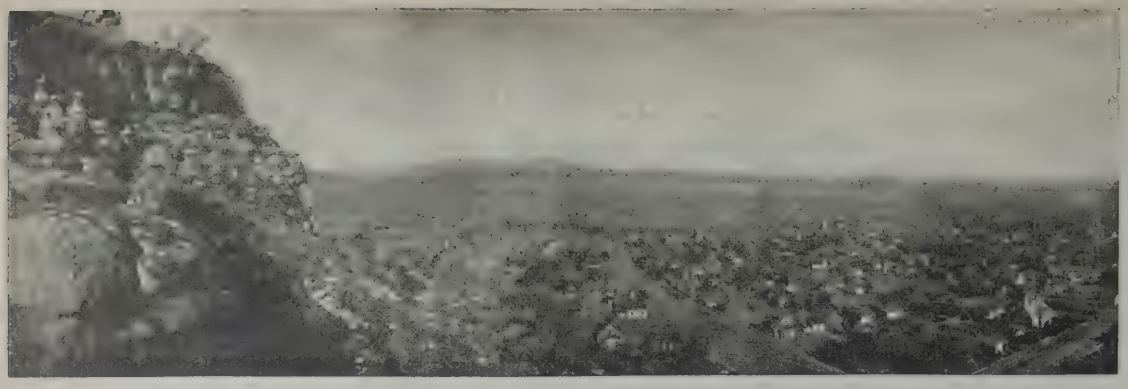
Raton is situated 243 miles north of Albuquerque, and 125 miles south of Pueblo, Colorado, on the main line of the great Santa Fe Railway system. It occupies a picturesque and inviting location in a sheltered valley and in the shadow of the beautiful Raton range of mountains at an elevation of 6,600 feet above sea level. It has an attractive, all-the-year-round climate. On account of the altitude, the temperature even during the height of summer is delightfully cool. The winters are mild and with very few exceptions the days are bright and sunshiny. The city is built in the foothills of the mountains, affording an ideal townsite of a gradual slope, with splendid natural drainage. The city has a solid and substantial appearance and one is forcibly impressed by the stores, business blocks, office buildings, and the many beautiful and attractive residences. Its streets, both business and residence, are wide and well graded.

The population of Raton, conservatively estimated, is close to 8,000. In 1900 the population, as recorded by the United States census, was 3,450, showing that there has been a remarkable gain during the past six years. The population is almost wholly American and of the better class. Its citizenship, in intelligence, culture and refinement, compares favorably with that found anywhere in the Nation. The business and professional men are as able as can be found in the Territory, and the citizens are most enterprising, contributing by their industry to the general welfare and wealth of the community. They are hospitable and take great pride in the city.

Raton has no "boom" features, and has grown only as population and business expansion compelled. The development of the coal mining industry, the growth of Raton as a center supply and distributing point, with three railroads in operation, are some of the sound reasons why Raton will double if not treble her population within the next ten years.

Raton is growing rapidly. This fact is in evidence on all sides. There are no vacant business houses and there are few residences for rent. Building is active. Within the past two years the city has made wonderful strides in the building line. During that time over four hundred new buildings of various kinds have been erected. A noticeable fact showing the faith of the citizens in their home town and the stability and permanency of its growth, is that home improvements have been made with home capital. Real estate and

Street Scene, Raton



City of Raton

represented and the total membership is large.

Raton has ample banking capital furnished by banks that sustain close and important relations to the business interests of the city. These are the First National, the National Bank of New Mexico, and the Raton National. The leading bank of the city is the First National, which transacts the largest business of any bank in Northern New Mexico. The First National Bank is progressive in its management and offers superior facilities for the transaction of the banking business in all its branches.

property values have increased and are increasing very materially.

No city in the Southwest has done more towards the education of its youth in proportion to its size and wealth than has Raton. The high standard of excellence maintained by the public schools is the pride of her citizens. The best of educational training is obtained. Its public schools, of which there are four, have taken prominent rank among similar institutions in the Territory. The enrollment of pupils numbers 1,200 and twenty-six teachers are employed. Colfax County is divided into thirty-six school districts and the total enrollment of pupils is 2,100. The sum of $44,830 was spent by the county in 1907 in the maintenance of the schools.

Raton is up-to-date in the matter of public utilities. The city is fortunate in having an inexhaustible supply of the purest water which is furnished by the Raton Waterworks Company. The source of supply is from mountain springs in Sugarite Canyon, four and a half miles northeast of the city where the company has a series of storage lakes.

The Raton Electric Light and Power Company operates a modern plant, supplying light, heat and power that is greatly appreciated by the citizens and represents an investment of $100,000 of local capital.

The Crystal Ice and Cold Storage Company, another home institution, with a daily capacity of thirty tons, supplies the city and tributary country with ice and operates a modern plant.

The Colorado Telephone Company, maintaining a branch office in this city, furnishes an excellent local and long distance service. The company serves 560 local subscribers. They occupy a handsome building, which, with equipment, represents an expenditure of $60,000.

The city has installed an up-to-date sewerage system and is yearly improving and extending it to keep pace with the growth of the city. In point of completeness and sanitary features it is one of the best to be found in the Territory.

Raton is the county seat of Colfax County, and the court house is a handsome and commodious structure.

The citizens of Raton are supporters of all that tends to uplift the individual along religious and educational lines, giving freely of their means in the upbuilding of a religious community. It supports a number of churches, some having handsome edifices of their own. The societies both social and fraternal, are nearly all

The city has two enterprising newspapers, the Range and the Reporter, both of which are liberally patronized, edited with ability and always at work for the city and its advancement.

The Raton Commercial Club has a membership of seventy-five and maintains handsome club rooms. It is doing effective work along practical lines in advertising and pushing the city to the front.

The city is divided into four wards and is governed by a mayor and board of aldermen, consisting of eight members. The city's affairs are ably managed.

Raton has one of the handsomest hotels in New Mexico. It is complete and up-to-date in every particular and its building is due to the enterprise of one of the city's leading citizens. The city has also one of the finest theaters to be found in the Rocky Mountain region.

Raton has three railroads, the great Santa Fe System, which transacts a large freight and passenger business, putting the Gate City in direct touch with the great centers of the North, East, South and West. The Santa Fe maintains division headquarters here and large machine, car and repair shops employing 500 men and disbursing $55,000 monthly, most of which money is spent in Raton. The Santa Fe has been a most important factor in the growth and development of the city.

The completion of the St. Louis, Rocky Mountain and Pacific

Residence of Chas. Springer, Cimarron, N. M.

A Canyon Road

Railroad in 1905, giving an additional outlet by way of Des Moines, New Mexico, forty-nine miles east of Raton, where connection is made with the Colorado and Southern, has proven of great advantage to Raton. The road is 106 miles long and taps the rich coal

fields of Colfax County. The St. Louis, Rocky Mountain and Pacific Company, an allied interest of the railway company, is the owner of immense tracts of coal land in the county all of which is adjacent to the railway. Both of these companies maintain headquarters in the city.

The Santa Fe, Liberal and Englewood railroad runs daily trains to Yankee, tapping the great coal fields in that section. The extension of these lines as contemplated by both of these companies means a great deal for the future growth of Raton.

It is from the coal mining industry and the repair shops of the Santa Fe railroad that Raton draws its main support. It is also a distributing point for general merchandise, mining supplies and other commodities for Northern New Mexico.

Low freight rates and cheap fuel is destined to make Raton a manufacturing center. Colfax County is one of the richest counties in New Mexico. As a producer of coal it excels all others. The county has an area of 3,877 miles and a population of 17,000. On the Johnson and the Barela mesas east of the city are 350,000 acres of tillable land, much of which is under cultivation. The farmers are prosperous. The staple crops are oats, wheat, barley and potatoes. The trade of the surrounding coal camps is transacted in Raton, which means a monthly payroll of $300,000 in and about the city.

The Raton coal field lies at the base of the Raton Range of the Rocky Mountains, and of the transverse Raton Range, which makes a sharp line of division between New Mexico and Colorado, and extends from 20 to 40 miles eastward through the foothills and out into the plains.

Of the development of the various coal fields of the Rocky Mountains, the United States Geological Survey notes that "its history is essentially the history of the general development of the region, which has no parallel elsewhere in the United States." The coal mines of New Mexico produced 1,800,000 tons of coal in 1906, as compared with 1,300,000 tons in 1900, and 375,000 tons in 1890.

Upon the output of the Raton field, the Geological Survey passes the favorable comment that the "entire product from the operating mines makes a good grade of coke." The coal is not lignite, but true bituminous.

The property of coking, which is limited entirely to bituminous coal, has given to coal possessing this peculiarity a value far above that of coal having similar composition but without the characteristic of coking. The principal source of supply of this character of coal is the Raton field. In fact, 70 per cent of the coking coal of the West comes from the Raton field and the adjoining Trinidad district in the State of Colorado.

As to the character of this coal and of mining conditions in New Mexico, the United States Mining Inspector says in a report to the government: "For extent of area, thickness of coal seams, good roof and floor, absence of gas, freedom from heavy bottom, absence of water, which if present would necessitate powerful pumps, in fact for all favorable conditions that go to make up a desirable producing field, New Mexico is far ahead of any other state or territory in America." Conditions in the Raton field are far different from those found in Southern New Mexico where the continuity of strata has been much disturbed.

The St. Louis Rocky Mountain and Pacific Company is the owner of 191,995 acres of coal land in this field—299 square miles—and of coal rights and surface necessary for mining in 328,430 acres or 513 square miles. The immense area controlled by this company—520,325 acres, or more than 800 square miles, is one-half as large again as all of the anthracite coal regions of Pennsylvania and five times as large as the entire Connellsville basin. It is

Miners Hospital

the largest body of coal land under one ownership in the United States.

The field shows three commercial seams, all outcropping above water level along the eastern escarpment of the mountain plateau, and all subject to drift mining. These three seams occur within an interval vertically of 800 feet. All yield good mining sections from four to ten feet in thickness, the lowest seams being the one principally developed, and within the scope of existing mines, yielding six to ten feet.

Based upon careful explorations and outcrop exposures in parts of the field, it has been estimated by competent engineers that the quantity of workable coal, assuming the veins to maintain a thickness of only five feet over one-half of the entire area of 800 square miles controlled by this great industrial organization, at about 2,250,000,000 tons. Similar investigations have led coal mining engineers to the conclusion that the remainder of the tract outside of the known coal area contains an "enormous reserve tonnage".

At the lowest computation had, the amount of coal already developed and proven would permit of an output of 3,500,000 tons per annum for 100 years while an estimate made upon the basis of a distinguished engineer would yield 10,000,000 tons a year for 225 years. The coal belonging to this company is as thick, as accessible and as good as in any of the competitive fields of which that belonging to the Dawson Fuel Company is the only one of consequence south of the Raton Mountains.

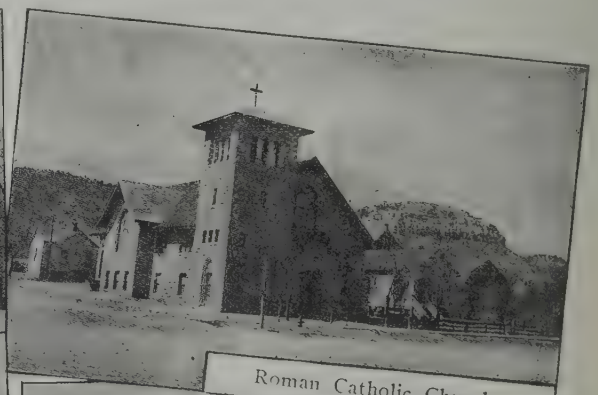
Owing to the advantageous location of the mines, all of them being drifts, and to the employment of gravity to the utmost, coal can be produced at a minimum cost. No mines in the West are better off in this respect. This company's coal mines are situated at Brilliant, Van Houten and Koehler, distant, respectively 11 miles, 15 miles and 23 miles by rail from Raton. The maximum daily output of these coal mines at the present time is about 125,000 tons per month.

The St. Louis Rocky Mountain and Pacific Company is the owner of two coke making plants, one of 186 beehive ovens at Gardiner, three miles from Raton, on the road to Brilliant, and the other, somewhat larger, on the Koehler branch of what is locally known as the "Rocky Mountain Railway," between Koehler Junction and Koehler. The output of coke from these plants will approximate 125,000 tons, almost all of which finds a market at the smelters in Arizona and Mexico.

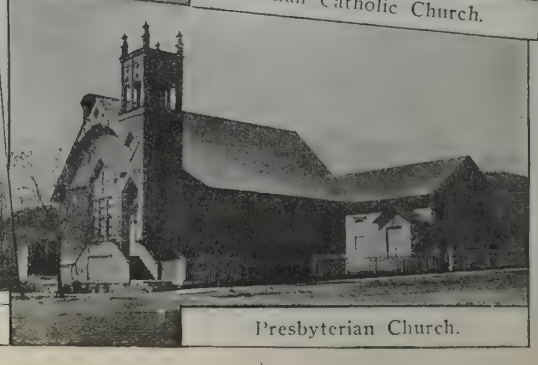
At one time or another every one has come under the spell of the sublimity of Nature, and who is there who is not inspired and reverent when brought into the presence of a majestic view? Nature furnishes the iron string to which every human heart has vibrated. One has not to look a great distance to find that which fills him with the spirit of reverence, but, as is most frequently the case, he strains his eyes into the far distance, when really that which he most desires, lies so close at hand that it is passed by. So it is that the people of New Mexico, who, with yearning in their hearts, look perhaps towards the Grand Canyon as a goal for the view sublime, and fail to appreciate that they have within their easy reach a scenic canyon, unrivalled in its wealth of magnificent splendor.

To him who has found his way through Sugarite Canyon and has once stood upon the Mesa, overlooking the head waters of the mountain stream, which is the source of Raton's water supply, little can be longed for. To describe this view it would be necessary to

Methodist Church.


Roman Catholic Church.

Baptist Church.


Presbyterian Church.

Blossburg Mercantile Company's Store at Gardiner

portray Nature in all of her magnificence, her radiancy and her majesty.

To the west there is the unbroken line of the lofty Sangre de Christo Range, which raises its snow clad peaks high into the clear blue of the sky. Off to the east as far as the eye can reach is a vast sweeping view of fertile Mesa lands, redolent with their crops of waving grain. Below stretches the verdant Sugarite Canyon, which opens out into a broad valley dotted with farms and broken now and then by diminutive mesas, which never look twice the same under the ever-changing haze of the purplish shadow lights, that are

Blossburg Mercantile Company's Store at Gardiner

thrown upon them by the shifting clouds. A mountain stream splashes foamingly along over a bed of boulders and feeds a series of silvery lakes, which start high up in the canyon and extend at intervals throughout its length. In their limpid clearness they resemble great mirrors, as the sunshine is reflected from them.

It is from this stream and from these picturesque lakes that Raton derives its abundant supply of water, sparkling in its purity. The Water Company is untiring in its efforts to supply Raton with pure water and, owning as it does, the many thousands of acres comprising this watershed, everything is done to guard against any possible contamination of the water. Though this land is all most excellent for grazing purposes, no stock is allowed to roam upon it. The stream and lakes are abundantly stocked with trout, which can only be caught under grant of the Company's special permit. Hence the great number of people, who would avail themselves of that rare sport, are excluded from the canyon.

In short, everything that will insure purity to the city's water supply is most carefully guarded. During the present season the Water Company has been to the great expense of having its reservoirs most thoroughly cleaned under hydraulic pressure.

In the winter ice is harvested from the lakes, which is stored in large houses in the canyon, and from there is distributed to ice dealers in New Mexico and the adjoining states. At the least two crops of ice, varying from 10 to 16 inches in thickness, are harvested each season under climatic conditions that cannot fail to excite comment. Under the bright New Mexico sun, which floods the canyon, even in the dead of winter, the ice is formed unfailingly and harvested while the on-looker, needing no protection against the weather, stands in silent wonder as he sees the great glistening field cut and stored by the latest and most modern improved devices.

Along the foot of the canyon are the Sugarite Mines, from which Raton is supplied with a most excellent quality of coal at a very low price. The mines are operated by the company and the coal is hauled by wagon direct from the mine to the consumer.

The Santa Fe, Raton and Eastern Railroad, another of the company's allied interests, is a standard gauge, fully equipped road, operating between Yankee, New Mexico, and Raton, where it connects with the Santa Fe System. A branch extends from Carisbrooke up into the Sugarite Canyon to the ice houses, making it possible to convey the ice crop quickly and economically into the surrounding country, where, on account of its purity and quality, the demand for it is large.

At present the S. F. R. & E. Railroad derives its greatest profit through handling the entire output of the Yankee Fuel Company's mines at Yankee ,and though this in itself is a lucrative business, it will soon be vastly augmented upon the completion of the Santa Fe,

St. L. R. M. & P. Company's Power House, Tipple and Shops at Van Houten

Raton and Des Moines and the Santa Fe, Liberal and Englewood Railroads, which will operate in conjunction with the Eastern and extend the line unbrokenly a distance of some five hundred and fifty miles down into the heart of Oklahoma, having a terminal at Oklahoma City. The benefits that will be derived by the people of Raton and the people along the line of the building roads are so many in number that to enumerate them would be a task, indeed. The road will travel through and derive its haulage from one of the richest agricultural regions in the country.

Much work has been done on both the Des Moines and Englewood divisions, the former of which is being steadily pushed towards completion. This road connects with the Santa Fe, Raton and Eastern at Carisbrooke, New Mexico, running eastward a distance of forty miles to the town of Des Moines. Here connections with the Colorado and Southern will be made and the Santa Fe, Liberal and Englewood will complete the system, continuing its course to Oklahoma City.

The people along the route and the towns through which the road will pass are doing everything in their power to further the interests of the road, as the country stands in the direst need of its completion. Towns along the line promise to assume the proportion of cities and already the busy whir of industry charges the air. The road will effect an interchange of the necessities of life; coal of unrivaled quality will be poured into the country direct from the Yankee mines; ice will be transported from the Sugarite, resulting in the building up along the line of cold storage and packing houses. It will open the way for the people to the south and east of Raton to ship their agricultural produce into the unlimited field of the great Southwest. About nine miles from Raton, New Mexico, on the S. F. R. & E. Railroad, is the Yankee Fuel Company's town of Yankee, which holds the envied title of being a model mining camp.

Located in a valley, surrounded by the mesa lands, it is most picturesque. The town combines an artistic finish with a practical arrangement and no point has been overlooked, which might add to the comfort and convenience of those who are so fortunate as to live there. As one approaches, his impression is that he is entering an ideal colony, so very bright and fresh do the rows of cottages look, painted all in white with roofs of green. A closer inspection serves only to strengthen this impression and, with memories of the gray, slate-colored mining towns in other parts of the country, over which there seems always to be a cloud of depression, one cannot refrain from greeting Yankee with exclamations of delight.

The cottages, which vary in size, but conform to a general plan, are substantially built and each on a plot of ground of sufficient size to allow every one his full quota of sunshine.

Climatic conditions are unrivalled in this New Mexican valley. The winters are mild and open; the summers pleasantly warm, with evenings delightfuly cool. The air is of that rare, bracing quality found only in the great Southwest. Yankee is supplied with water, pure and sparkling, which is piped from springs in the adjacent canyons.

The miners' interests are always paramount. Nothing has been overlooked, which may serve to make his leisure hours bright and enjoyable. An amusement hall, perfect in its appointments, has been

St. L. R. M. & P. Ry.—Una de Gato

erected and is maintained by the Company. Here the miners and their families gather. For those who wish games there are excellent bowling alleys and billiard and pool tables. The rooms on the ground floor are spacious and include reading and refreshment rooms. The second floor contains a well equipped theater, the auditorium of which may be cleared and used for dancing. The special feature of the Amusement Hall is its splendid collection of pictures, which literally cover the wall space. Here may be found most excellent reproductions of the works of the world's greatest masters. It creates an atmosphere of the beautiful, which prevails everywhere. Here one may look upon and study and come to know the works which evolved themselves in the minds of Leonardo de Vinci, Murillo, Velasquez, Rubens, and Rembrandt. It brings into the life of the people of Yankee advantages far beyond those possessed by many a city.

St. L. R. M. & P. Ry. Bridge—Canadian River

The buildings are so arranged as to form a hollow square in the centre of the town, which is used as an athletic field. A commodious grandstand accommodates the crowds that gather to watch their invincible baseball team wrest the honors from all comers. Field sports of every description are indulged in and the keenest interest is manifested in all out-of-door exercises.

The Yankee school assures to the children every advantage. Under the able direction of an Eastern college graduate, the work is conducted along the most liberal and advanced lines of modern educational methods. The children are taught, too, the skillful use of their hands and the results of their work pay a glowing tribute to their instructor.

It is the aim of the Company to provide for every need of its men. For the ill and injured there is a hospital, thoroughly modern in its equipment, where every care is shown and every attention dispensed. The hospital is in charge of an experienced physician and capable assistants.

From the complete stock carried by the Yankee Mercantile Company the miner may satisfy his simplest want or indulge his fancy. Besides the full line of groceries and provisions, there is carried a carefully selected line of dry goods, shoes, furnishings, etc.

Fortune joins with Nature in favoring Yankee. The future of the little camp is of the brightest. With an unrivaled location, and its vast coal deposits of the most superior quality, it is easy to predict for it a splendid future.

The Sangre de Cristo range of the Rocky Mountains forms a natural boundary between Colfax and Taos Counties. On the eastern slopes of its precipitous ridges and sentinel peaks, all over the plains to the higher altitudes of the Raton and the Sangre de Cristo ranges, a vast body of timber, hitherto inaccessible, has been opened to market by the Rocky Mountain Railway.

Timber on Line of St. L. R. M. & P. Ry.

In the foothills the timber is scattered and usually small, but farther back up the valleys and on the slopes and crests of the high mountains, it is dense and of large dimensions. In a region in which the demand for mine timbers is great and constant, even trees of modest proportions have definite value. Only the construction of the Rocky Mountain Railroad was needed in order to transport the product and insure lumbering operations on a large scale.

Several kinds of trees producing valauble saw

In Sugarite Canyon

timber, as railroad ties, mine props and other material, grown within the area in question. The United States Bureau of Forestry gives to the prevailing timber of New Mexico the specific names of "bull pine" (*pinus ponderosa*), "white pine" (*pinus flexilis*), Englemann spruce" (*Picea engelmanni*), "white fir" (*abies concolor*) and "Douglass spruce" (*pseudotsuga taxifolia*). In the local designation other names are yellow pine, Rocky Mountain pine, red spruce and white spruce. The prevailing "bull pine" is vigorous, very hardy and forms forests up to high altitudes. The lower foothills bordering upon the plains, are covered with an open scattered growth of nut pine and juniper. On the headwaters of the streams and the sides of the higher mountains the larger trees, suitable for saw timber, run from two to two and one-half feet in diameter. Below 8,000 feet in elevation above the sea, the timber is smaller than in higher altitudes. The pines are used for lumber, railroad ties, piling, telephone and telegraph poles and mine material. The white spruce is available for paper pulp. Experts who have examined the timber in the Moreno Valley in Colfax county, report it to be the best in New Mexico.

The high and unbroken Raton mountain range bounds the timber belt on the north, but deep valleys, leading back from the plains, penetrate the region from the south and east. Because of this configuration of the country, as well as on account of conditions of ownership, the transportation of all these products is assured to the St. Louis, Rocky Mountain and Pacific Railway Company. Sawmills have been located and are in operation at various points.

Street Scene, Raton

The Cimarron and Northwestern Railway penetrates the lumber region described. This railway is 22 miles long. The Continental Tie and Lumber Company is establishing mills of a present daily output of 125,000 feet of lumber and under normal business conditions will ship about 5,000 car loads of lumber annually.

Mr. T. A. Schomburg is the President of the lumber company and according to his careful estimates the amount of standing timber on the eastern slopes of the Rocky Mountain range in Colfax County approximates 1,000,000,000 feet, 18,000,000 railroad ties and a vast amount of mine material. Still other forests of great extent on the western slope of the Sangre de Cristo, or the Taos range, will become accessible when reached by a railroad.

The market for all this lumber is found in Colorado, Western Oklahoma and Kansas and in the towns and mining camps of New Mexico.

Colfax is one of the leading mining counties in New Mexico and its annual mineral product is worth over $1,000,000. Gold and copper are produced in the vicinity of and at Elizabethtown, which is one of the famous mining camps of the west.

Stock raising is a great industry in Colfax county. Covering the prairies between Des Moines and Cimarron Canyon and throughout the mountains and canyons are vast ranges. According to the best information obtainable, from 50,000 to 75,000 cattle are grazing in this part of the Territory of New Mexico. There are also large numbers of sheep, goats and horses. In the adjoining county of Union there are 600,000 sheep.

The natural precipitation in Colfax County averages from 15 to 25 inches annually. Accordingly most of the farming and fruit raising is carried on mainly under irrigation, and upon such areas as can be provided with water. The prairie and valley lands when irrigated produce large crops of wheat, oats, barley, alfalfa and hay, and are particularly adapted to the cultivation of sugar beets, while the melons rival those of the Rocky Ford district in Colorado.

Alfalfa is a staple crop and three cuttings a year is the yield. As food for live stock alfalfa heads the list of forage crops.

Where irrigation is difficult much attention is being paid to what is known as "dry farming." By this method of soil culture arid land can be made productive, as has been abundantly demonstrated in Western Kansas, Nebraska and Eastern Colorado.

Some of the finest fruit in the world is raised in Colfax county. On the Vermejo, Ponil, Cimmaroncito and Rayado are many orchards in which apples, pears, peaches and small fruits grow in abundance. Some of these orchards have not missed more than a single crop in twenty years.

There are splendid opportunities in Colfax county for men with big and little capital, for miners, horticulturists, agriculturists and stock men, and also for all those whose lack of means is compensated for by intelligence, energy and a strong determination to win in the struggle for independence and wealth. Men who desire to invest in manufacturing industries will find Colfax county an especially attractive field with promises of great and sure returns on an intelligent investment. The vast beds of coal- guaranteeing cheap fuel, the good railroad facilities, the ample water power, the oil indications, the nearness of the markets of the Rocky Mountain States, Mexico and the Orient, the advantageous climatic conditions and the nearness of the supply of raw material, make a combination which should make certain lines of industry pay handsome dividends. The county can furnish abundant water-power by means of dams which would at the same time form storage reservoirs from which large tracts could be irrigated. Iron and steel rolling mills, smelters, beet-sugar factories, tanneries, shoe factories, woolen mills, brickyards, and glass works are industries which would enjoy special advantages in Colfax county owing to the cheapness of fuel, and the convenience of water power, and the great abundance of raw material and the excellent climate which would make work in industries of certain kinds more steady and comfortable than anywhere else in the United States.

Colfax County is a great, prosperous, progressive and promising section of New Mexico; it is an empire in itself. It is on the eve of a marvelous growth which will bring a teeming population and great wealth to this locality.

In Sugarite Canyon

Springer, Colfax County, New Mexico, Center of a Great Irrigation Country

A Description of Some of the Irrigation and Water Systems Now Being Built and Completed.

WITH the many new projects, the construction of ditches, reservoirs and dams, the bringing of large quantities of water from the mountains to the west to spread over the thousands of acres of fine land tributary to Springer, it is bound to make the city the center of irrigation and of the sugar beet industry and other farm products raised in Colfax County. With a spur of the Santa Fe Railroad running up to Miami, Springer practically has a railroad east, west, north and south, and twenty-five thousand acres of sugar beets can be grown within a radius of twenty miles. All we need is more farmers to till the soil, and more reservoirs for storing the waters. Then our conditions will be perfect for making this the greatest agricultural county in the United States. Farm lands tributary to Springer, where the irrigation companies are spending thousands of dollars, are selling cheaper than in any other state or territory. The companies are doing all in their power to assist in building up an empire composed of sturdy farmers. Delegates to the Irrigation Congress should make a special effort to stop off at Springer and see the great ditches and reservoirs and the construction that is going on. Title to the land is perfect. No delay; and a warranty deed of any of these lands is as good as a gold bond.

A Sheep Ranch Near Springer

Springer, Colfax County, New Mexico, has the best location for a sugar-beet factory of any town in New Mexico. It is surrounded by a large acreage of sugar-beet land. Growing towns, which are bound to come to this place for their supplies,—with Miami on the west, French and Maxwell City on the north, Taylor, Abbott, and Roy on the east, Colmor and Nolan on the south, Springer is bound to be the city of South Colfax County.

FARMING IN COLFAX COUNTY

The quantity of land which can ever be cultivated successfully in New Mexico is comparatively small. As a general proposition, it may be said that no crops grow in New Mexico, year in and year out, without irrigation, and as a very small proportion of the population is engaged in farming, many of the agricultural products consumed, are brought from neighboring states at a great expense for freight. The cost of commodities which are brought in, naturally regulates the value. The New Mexico farmer receives a special figure equal to the original price with the freight added, and it is a fact that he receives better prices at home than he can possibly get by shipping. A large percentage of the population is engaged in mining, stock-raising and other lucrative pursuits, hence there is always a good local demand for the products of the farm.

THE SPRINGER DITCH COMPANY

The Springer Ditch Company is one of the oldest water systems in Colfax County, and was formerly owned by the Maxwell Land Grant Company, and was recently turned over to the farmers and water users under the system. The ditch covers some seven thousand five hundred acres of fine choice land, about four thousand acres under cultivation, and owned by small farmers, and three thousand five hundred acres which can be bought from private parties who wish to divide it in small farms. Grand opportunities are offered any investor seeking investment, and one cannot do better than to come to Springer and investigate. The large amount of water which has been wasted from year to year will soon be controlled. We have made wonderful gains in this direction the past year; and with the building of the great Cimarron Dam at Moreno Valley, (the most perfect reservoir site in the United States), Colfax County will have more large reservoirs; and Springer will have more good land subject to irrigation tributary to it than any other town in New Mexico. Irrigation means much to this city; and we want every delegate to the National Irrigation Congress to pay a visit to this part of our Territory, and take the news home to their eastern friends, and describe to them the garden spot of New Mexico and of the great West. Space will not allow us to give a minute description of some of the ditches, reservoirs and land companies.

FARMERS' DEVELOPMENT COMPANY

Or the Great Miami Ranch, one of the new enterprises of Colfax County.

This Company is composed of financially strong Ohioans, who have made wonderful progress in developing their property.

Imagine a beautiful plain of ten thousand acres of fine, level land laid out in forty acre tracts, and in the center a section of land laid out with sixty ten acre tracts for gardens, orchards, and small farms. And in the center of these tracts, a forty acre town site laid out into lots with water running in every direction, everything artistically arranged, and it will give you a bird's eye view of Miami. To appreciate this wonderful growing settlement, you should pay it a visit. When you consider that everything is new,—new people coming to a new country, farming under new modes, new conditions, new ditches, new reservoirs, all constructed within the present year,—we venture to say that no other settlement in the United States can be found to equal, or be compared with it. You would be surprised to see the improvements made by this thrifty company of people. In fact, the conditions that surround the town of Miami cannot be produced anywhere in New Mexico or in the West. New farmhouses costing from two thousand to four thousand dollars have been built;

Farm Life, Colfax County, N. M.

everything has been done by the Company within their power for the benefit of the farmers and water users under the ditches and reservoirs. We clip the following from the Company's folder, which will be interesting for any reader interested in irrigation. And every delegate to the National Irrigation Congress should avail himself of the opportunity and visit this property:

MIAMI RANCH. WHERE IS IT? WHAT IS IT?

The Miami Ranch is situated in the northeastern part of New Mexico, near Springer, Colfax County. New Mexico, historically speaking, is one of America's chief antiquities, yet in the development of her resources she is one of the youngest of Uncle Sam's children. The fact is due to peculiar political and economic conditions—many of her richest districts having been held by single individuals in immense grants of hundreds of thousands of acres. It has only been within the last few years that the resistless demand for agricultural lands has forced the breaking up of these miniature empires and opening them to settlement.

One of the oldest and largest of these grants was the Maxwell Land Grant, which covered 1,250,000 acres of the richest lands in the "Sunshine Territory."

The Miami Ranch, to which we invite your particular attention, is by all odds the choicest agricultural portions of the Maxwell Grant. It contains about 18,000 acres, of which 1,000 lies in a gently undulating valley; 3,000 comprises the slope of a lofty mesa or table-land, and the balance forms the top of the mesa referred to.

As one approaches the ranch from the east the view is inspiring. Directly before you lies the broad, gently undulating valley—absolutely free from rocks or brush of any kind—covered only with a dense carpet of gramma grass. Meandering through the valley for its entire length is the clear, sparkling Rayado River, which receives its never-failing supply of purest water from the lofty snow-clad mountains of Western Colfax County.

THE WATER SUPPLY OF MIAMI RANCH

It is in its water supply that the Miami Ranch particularly excels. The Rayado River, as before stated, has its source in the mountains to the westward, which are among the loftiest in the United States—rising to a height of nearly 14,000 feet. This insures a never-failing stream of the purest water from springs and melting snow. In fact, the Rayado is one of the few streams of the Central West which was never known to go dry. It is teeming with trout, which is final proof of its purity. During the spring months it flows a torrent. Heretofore, with the exception of a trifling amount taken out by four insignificant ditches, this entire wealth of water has been going to waste. The Farmers' Development Company has established first priority to the use of the regular and flood waters of this stream, which means that all persons, with the exception of those using the small ditches above referred to, wishing to take water from the Rayado River and tributaries, must wait until we have sufficient for our lands. The order of priority means volumes in the distribution of water for irrigation.

The Farmers' Development Company is constructing ditches and storage reservoirs, which will insure an abundant supply of water for all lands which they will offer for cultivation. The quality of the work on the irrigation plant is such that it will last for all time to come.

With every acre of land under ditch there goes a permanent free water right. A nominal maintenance fee will be charged for operating and keeping the works in repair until the irrigation plant passes into the hands of the farmers.

FARMERS' DEVELOPMENT COMPANY'S MIAMI RANCH IRRIGATION SYSTEM

The Farmers' Development Company came into control of 18,000 acres of the old Jose Valdez ranch on the Rayado River west of Springer, Colfax County, New Mexico, in the early fall of 1906. The Company contemplating irrigation of 10,000 acres of said area immediately gave notice to the Territorial Engineer of its intention to appropriate all the then unappropriated waters of the Rayado River and tributaries. The notice now appears in the records of this office under date of October 5, 1906.

In January, 1907, plat of Reservoir number one, and outlet canal therefrom was approved by the Territorial Irrigation Engineer. During the following summer applications, plans and specifications of Reservoir number two, and inlet and outlet canals in connection therewith, which were a part of the Company's original plan of development, were approved by the office and a permit to construct same was granted.

The actual work of construction was begun in August, 1907, and was pushed vigorously so that now all construction work in connection with Reservoir number two, and inlet and outlet canal, is completed and that portion of the company's system is in full working order. The construction involved the expenditure of about $80,000.00.

The main dam of the Reservoir is 1,100 feet long, 200 feet wide at the base, and 45 feet high. It was constructed in layers of selected earth eight inches thick, and each layer was thoroughly puddled and rolled. The slopes are 3 to 1 on the inside and 1½ to 1 on the outside. The entire face of this huge dam is covered with a heavy layer of hand laid rock rip-rap. The base of the dam was entirely cleared of vegetable matter and a puddled trench five feet deep was dug the entire length of the dam to prevent seepage and help form a perfect bond.

The outlet consists of a line of 30 inch vitrified pipe laid in a trench imbedded in concrete and entirely incased in a three inch thickness of the same material. Every fifty feet along the outlet is a concrete wingwall to prevent percolation along the surface of the conduit. Heavy concrete walls are constructed at both ends of this reinforced outlet. The outlet is controlled by a 36 inch iron valve

placed at the upper end of the conduit and is operated from a platform by means of a horizonal wheel turning on the threaded valve stem. Around a portion of the north side of the basin is a dike 2,200 feet long and 12 feet high. The dike is also heavily rip-rapped. The capacity of this reservoir is 2,500 acre feet or about one billion gallons. The basin is in the Heck Arroya from which it draws a portion of its water supply. The larger portion of its supply, however, comes from the Rayado River through an inlet canal one and one-fourth miles long, which has a capacity of 250 cubic feet per second.

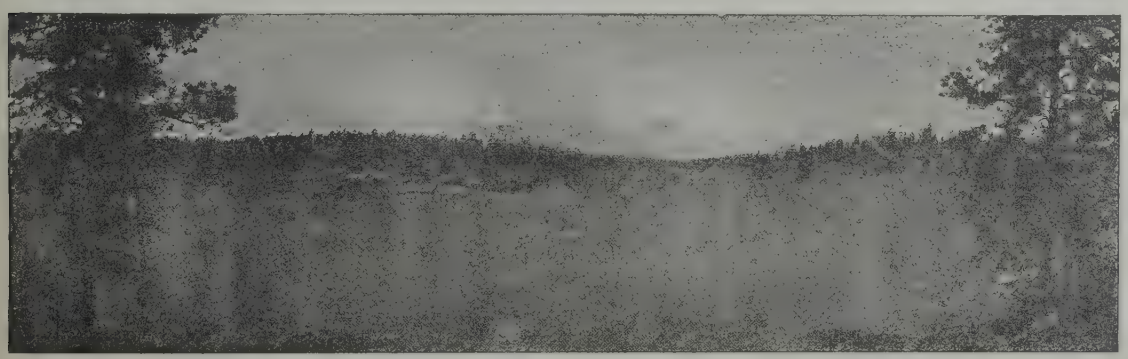
The outlet canal is ten miles long and has a capacity of 150 cubic feet per second.

The system was surveyed and designed by Engineers Wendall V. Hall of Santa Fe, and R. E. Young of Denver, Colorado, and was constructed under the supervision of W. A. Peck, C. E., of Denver, Colorado. The contractors were Messrs. Colt & Winburn of Springer, New Mexico.

Thirty-five families are already living upon their farms and receiving water through this system. Their ground being mostly sod, the main crop to which it has been seeded this year is oats. Many attractive residences have been built, and the new town and post office of Miami have been established upon the tract. A new school district has also been established for the benefit of the settlers, and a school is expected to be in operation at the opening of the coming school year.

The Company contemplates enlarging its service by the construction of additional reservoirs. The sites for these reservoirs, which are three in number, are covered by filings in this offce. They are Reservoir number one which lies in the basin of the Rayado River across the west boundary line of the Company's property. Reservoirs numbers three and four are situated in the mountains toward the headwaters of the Rayado River in such a manner that they can be economically utilized in connection with the system already constructed. The combined storage capacity of the three reservoirs as shown by plats and field notes in this office is about 10,000 acre feet, or three and one-half billion gallons.

The quantity and quality of water and soil and climatic conditions are such that this section should become one of the leading agricultural districts of New Mexico. The large beet sugar companies in Colorado are displaying a great deal of interest in the district, and there is every reason to believe they will locate a factory in the neighborhood as soon as it has population sufficient to produce the beets. Besides producing a beet which is high in tonnage, sugar contents and purity, the district is well supplied with coal, coke and lime rock, which makes it an ideal location for a sugar factory.



THE FRENCH LAND AND IRRIGATION COMPANY

One of the largest companies developing and constructing ditches and reservoirs, and improving farms in Colfax County is the French Land and Irrigation Company. This Company purchased from Captain French, fifty thousand acres of choice land located north and west of Springer, lying on the west side of the Atchison, Topeka and Santa Fe Railway, and on both sides of the El Paso and Southwestern Railroad. This land was formerly a part of the Maxwell Land Grant and was acquired by the new Company at an immense cost. The Company consists of Illinois men who are putting forth all their energies to make this one of the garden spots of New Mexico. In the center of the tract, a new town is laid out called French, located at the junction of the Santa Fe and El Paso and Southwestern Railroad. The new town will be a great addition to this part of Colfax County. New buildings are going up every day, and town lots are selling fast, and surrounded, as it is, by fine irrigated farms, the town will surely aid in the settling of this new and prosperous settlement. The following is taken from the Company's folder, and as the delegates to the National Irrigation Congress are on their way to Albuquerque a good view of this large tract of land is had from the train between French and Springer.

Our land is the most fertile portion of that well-known property, "The Maxwell Land Grant," and is generally level, sloping gently to the south and east, just sufficient for easy irrigation; is absolutely clear of rocks, or brush of any kind, and is covered with a rich sod of native grasses. Old settlers contiguous to this tract of land have proved the productiveness of the soil, for even by primitive methods of irrigation, they have grown wonderful crops of alfalfa, rye, oats, barley, wheat and sugar-beets.

PLENTY OF WATER

The land of this Company is watered on either side by the Cimarron and Vermejo Rivers, also by the Ponil, Cerrososo and Van Bremmer creeks, which flow from the ice-clad and snow-capped peaks of the Cimarron and Taos Mountains in the west and northwest, and which contain a sufficient drainage area of more than half a million acres. An ever-abundant supply of water is consequently assured.

From the above streams, by means of diversion weirs, the water is diverted into canals leading to seven large reservoirs, with a total storage capacity of 64,500 acre feet of water. These reservoirs can be filled twice each year, thus affording 129,000 acre feet of water, which can be drawn upon when required, and, by means of distributing canals, the water is conveyed to every accessible acre of the land.

To get a better idea of the lands belonging to the French Land and Irrigation Company, homeseekers and investors should come to Springer, and, with the agent of the Company, or Chief Engineer, ride over the properties and see the large opportunities for farming, fruit growing, and the raising of sugar-beets under irrigation. Everything is new at the present time, and the investor who buys land gets in on the bottom floor, for the older these properties are, the higher priced the land.

THE JARITAS DITCH AND RESERVOIR COMPANY

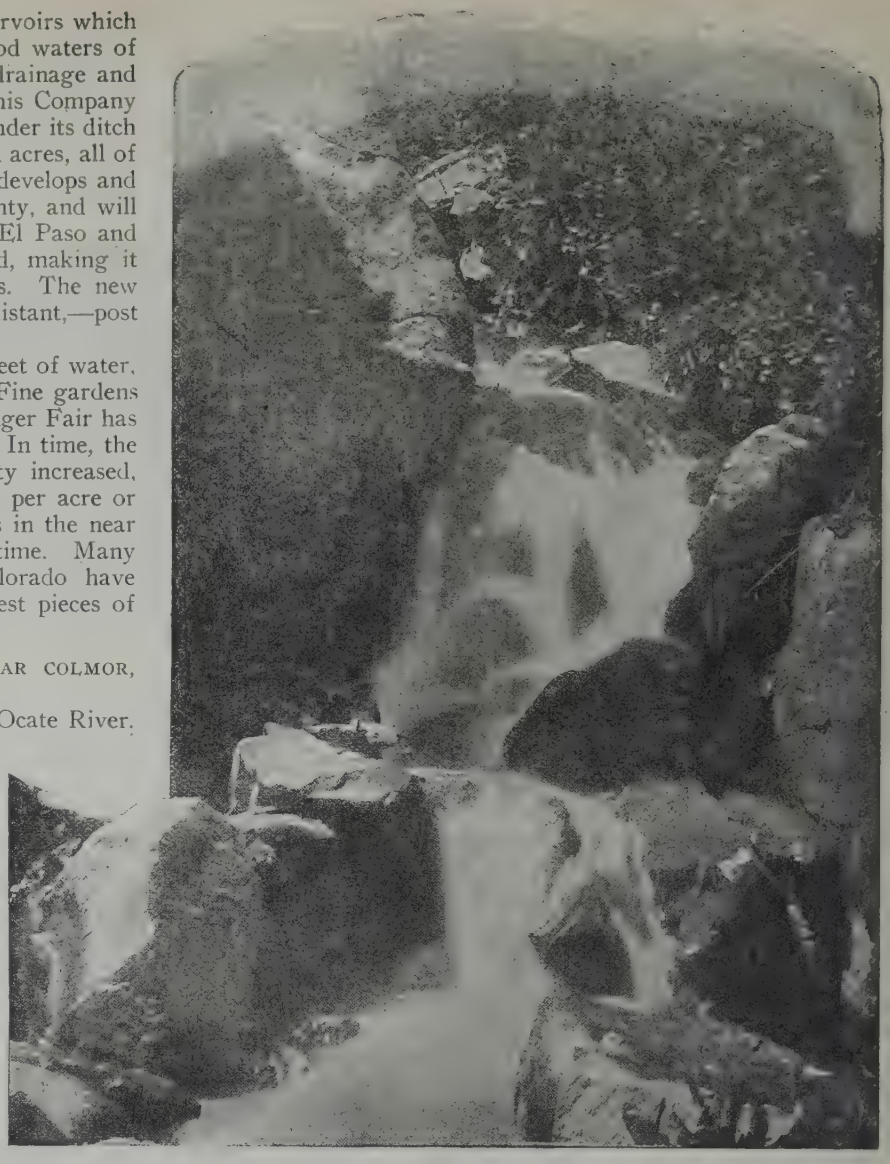
One of the first irrigation systems for the storing of flood waters built in New Mexico is that of the Jaritas Ditch and Reservoir Company. The Company has spent some twenty

thousand dollars in the construction of ditches and reservoirs which are all completed, and will store and impound the flood waters of Chico and Jaritas Arroyas, which have a very large drainage and water shed. The Territory of New Mexico assisted this Company in segregating some three thousand acres of fine land under its ditch system. Private parties alone own some three thousand acres, all of which will be offered in small farms, as the Company develops and stores its water. The soil is the finest in Colfax County, and will make the best sugar-beet land in New Mexico. The El Paso and Southwestern Railway runs through part of this land, making it easy for loading sugar-beets and other farm products. The new town of Abbott, recently laid out, is only five miles distant,—post office, store and telegraph office.

The reservoirs will store about five thousand acre feet of water, and ordinary years can be filled two or three times. Fine gardens have been raised for the past three years, and the Springer Fair has always had a fine display of the Company's products. In time, the ditches will be made larger and the reservoir capacity increased, and land under this system will be worth fifty dollars per acre or more. The Company will offer land and water rights in the near future, and this land will double in value in a short time. Many prominent men from Michigan, Nebraska, and Colorado have looked over this proposition, and call it one of the best pieces of work anywhere in the West.

THE SPRINGER LAND AND IRRIGATION COMPANY, NEAR COLMOR, EIGHT MILES SOUTH OF SPRINGER

This Company owns the oldest water right on the Ocate River. The ditches cover about three thousand acres of fine land, beginning one mile from the station and running down the river for five miles. Colmor Lake, the finest natural reservoir in New Mexico, holding twice the amount of water needed for the land under the system. A small company, backed by enterprising men, who are developing and improving as fast as possible. A large amount of work has already been done. The water for irrigation is stored in the beautiful Colmor Lake, of which a fine view is had from the east window of a Santa Fe train eight miles south of Springer. When fully developed, the Company will offer small farms, as the lands are better for small farming, such as sugar-beets, and all kinds of vegetables. The reservoir, when completed, will hold six thousand acre feet, and can be filled almost any month in the year. The main inlet ditch, when completed, will be one of the largest in Colfax County, and on account of the large amount of water this Company can store, the land will be very valuable. This is only one of a dozen irrigation companies that is going to make Springer the irrigation City of New Mexico.



A Rugged Canyon Scene

LAKE CHARETTE RESERVOIR AND DITCH COMPANY

The Lake Charette Reservoir and Ditch Company, of Springer, N. M., which has been incorporated under the laws of New Mexico, has the second recorded water right on the Ocate River, which during flood times, affords a flow sufficient to irrigate from 20,000 to 30,000 acres of land. The catch basin includes about 320 miles of territory and the precipitation runs from 14 to 28 inches annually.

The reservoir is ideally fitted in every way for storage purposes. It is the crater of an extinct volcano and the ages that have transpired since it was in eruption have rendered its slopes impervious to water. The reservoir has a capacity of 18,000 acre feet.

The peculiar physical conformation of this reservoir site together with the natural conditions of land contour, makes it an especially interesting study to one familiar with the subject of irrigation. The lands to be irrigated by this project lie in Colfax County near Springer, and have that easy slope so pleasing to the eye of the practical irrigation farmer. The soil is of a rich alluvial character, and is well adapted to the cultivation of all kinds of grain and vegetables, besides apples, pears, plums, cherries and a large variety of small fruits. The land lies adjacent to the Atchison, Topeka and Santa Fe Railroad, which will afford ample transportation and shipping facilities for the farmer. Nature has done everything necessary to make this a fruitful, prosperous region excepting in the element of rainfall, and this deficiency will be supplied by the storage of the waters that now go to waste for lack of storage facilities.

When the work of the Charette Reservoir and Ditch Company shall have been completed, this valley will be one of the garden spots of New Mexico. These lands are, without question, the most valuable in the United States. When watered and cultivation is applied to these lands, the transformation that occurs, fills one with wonder. It is an inspiration to industry, a stimulus to endeavor to witness the super-abundance of plant life that springs into existence when cultivation and water assist Nature in her efforts to propagate plant life.

The Taos Valley in New Mexico

THE TAOS VALLEY is one of the finest in all New Mexico. Fernandez de Taos is the county seat of Taos County, romantically situated in this beautiful valley, surrounded by mountains which rise to a height of 14,000 feet above the plain. The town of Fernandez is very interesting, quaintly built around a large plaza. Its church possesses considerable antiquity. Before the coming of the railroads into New Mexico, Fernandez de Taos was a commercial center of great importance. Among the early residents were Col. Kit Carson, Governor Charles Bent, who was assassinated here during the Pueblo insurrection, Col. Ceran St. Vrain, Judge Beaubien, Lucien Stewart and others. A good public school, mission schools and a Loretto Academy are the educational facilities of the town. There is published a weekly newspaper, in Spanish and English, the Revista de Taos. The population is about two thousand.

Taos Valley

Only three miles to the northeast, under the shadows of the great mountains, and occupying both sides of a clear, bright river, is the Pueblo of Taos, undoubtedly the most interesting native settlement in the entire Western Continent. Scores of tourists come to visit it annually, particularly on its annual feast day, San Geronimo, September 30. The Jicarilla Apaches, the Navajos, as well as the Pueblo Indians from the South, send delegations to this festival, and the settlers for scores of miles around gather at the Pueblo on that day. The population of the Pueblo has been decreasing in numbers the past few decades and numbers but few over 400 at the present time. The Indians cling tenaciously to their primitive customs.

Ranchos de Taos is four miles south of Fernandez and is the largest settlement in the valley. It has two flouring mills and is surrounded by beautiful orchards. It is the center of 60,000 acres of fertile land of which about 10,000 acres are under cultivation. There is a good public school and the headquarters of the Presbyterian missions in this section is located here. The population exceeds two thousand.

Describing this pre-historic communal dwelling, a distinguished writer has said: "They are not tombs of fabulous kings, nor impenetrable secrets of what a world has forgotten more than it ever knew; they are just monuments to human love of home and the human ingenuity of making a safe retreat even in the childhood of the race. In a word, they are the two great communal houses in which the Pueblo Indians of the northernmost valley in New Mexico have been making their simple history for probably more than five hundred years.

When Francisco Vasquez de Coronado, the first North American pathfinder, was making his astonishing marches through our Southwest, 350 years ago, his subordinate, Captain Francisco de Barrio-Nuevo, marched with a few men over 100 miles up the Rio Grande from Tiguex (a Pueblo about where Bernalillo, New Mexico, now stands) and finally reached the large and powerful village of Braba, as the Indians called it; the explorers named it Valladolid, and Castaneda, the peevish chronicler of Coronado's expedition describes it so well that it has been conclusively identified with the present Taos.

Today the Pueblo pyramid houses of Taos stand (as they did then, 69 years before there was an English-speaking resident in the New World) on the two sides of a chuckling trout brook, in a lovely valley among the last vertebrae of the Rocky Mountains. Close on

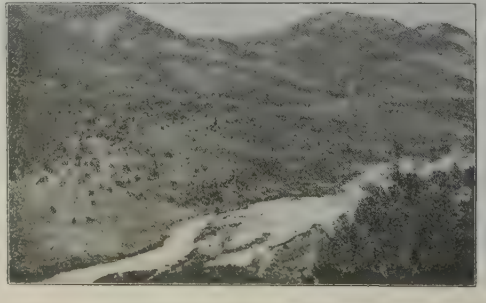
Taos County Scenes

the north the massive peaks spring abruptly from the little plain; to the east and south the ranges of Picuris and Santa Fe. On the west the grand canyon of the Rio Grande splits the valley from the timbered uplands to the southern extremity. It is one of the finest landscapes in the Southwest; and despite its altitude of over 7,000 feet, one of the fairest valleys.

Nowhere in the world is there a more startling page of ancient history brought down to date. All of Europe has nothing which remotely suggests these human beehives, these pyramidal fortress homes of the northern Tiguas. Even among the most strangely picturesque population of China, India and the isles of the sea, there is no mate to Taos. It is only in America, and only in New Mexico that such things are to be seen, and they are not common even there. Zuni, the one village that is left of the Seven Cities of Cibola, whose fame led to the first discovery of Arizona, New Mexico, Oklahoma, Colorado and Kansas by Europeans, is of the same type as Taos—bigger, but far less beautiful. And Acoma, the Sky City and the Pueblos of Moqui are diminished specimens of the same strange development. But Taos, queen of all, the most perfect remaining type of the terraced communal house of the ancient pueblos, which was in its turn the most astonishing domestic architecture ever invented by man, savage or civilized."

Fancy some child of the giants trying to build a pyramid of its overgrown blocks; a pyramid over 400 feet on a side, the "steps" formed by the superimposed cubes being about ten feet high, and six layers of them laid up with childish irregularity. Fancy this vast plaything turned into a labyrinth of cells of stone and adobe, with snowy walls of gypsum, and crooked doors and earthen chimneys on each stage and bristling ladders from step to step. Populate it with a few hundred beings of active bronze clothed in strange oriental garb, inscrutable but human, reserved but gentle, living their quaint lives with our selfsame joys and sorrows, passions and hopes and fears, and with more than our balance in it all, and you begin to have a rudimentary notion of Taos." The Taos Valley is beyond all doubt one of the best and fairest in all the Southwest. All of the cereals are grown and of a kind that is unsurpassed. The climate is almost perfect. The water of the purest; the fruits, the choicest and the soil undoubtedly ranks with the best on the face of old Mother Earth. The yield of wheat, oats and barley is enormous; in fact phenomenal. It was from Taos that the Mormon Argonauts bought their grain for planting purposes in the valley of the Great Salt Lake. In fact the Taos Valley resembles to a marked degree the valley of the Great Salt Lake, although it is warmer and in a sunnier clime. During recent years American colonists have introduced apple and pear trees, the fruit from which for size, color and flavor is unexcelled. Alfalfa produces an abundant and a profitable crop.

The Taos Valley Land Company is a new corporation operating in this valley. It is the owner of 15,000 acres of rich agricultural land under the old system of ditches upon the Antonio Martinez Land Grant. Its lands are located at an altitude of from six to seven thousand feet, the soil is of a rich red color and consists of a sandy loam and volcanic ash to a depth of three to six feet, with a clay subsoil. The water is abundant at all season of the year and with the completion of the reservoir system contemplated by the company, together with the old water rights purchased by the company, opportunities for the up-to-date farmer are given in this valley not found in any other portion of the Territory. The valley is reached by the Denver and Rio Grande Railway.



Looking North From Des Montes

Upon completion of the St. Louis, Rocky Mountain and Pacific Railway, which is now constructed to a point within 35 miles of Taos, the farmers will be able to feed annually thousands of cattle and sheep from the adjacent ranges, as well as market train loads of the finest apples and pears in the world.

Taos County is a portion of New Mexico that is rich in mineral deposits of low grade gold ores, silver and copper which only await the coming of the St. Louis, Rocky Mountain and Pacific Railway to be opened to the world.

Facts About Historical San Juan County

By H. B. HENING, Secretary New Mexico Bureau of Immigration

SAN JUAN COUNTY offers to the home-seeker:

A million and a quarter acres of the public domain, subject to entry under the land laws of the United States.

An unfailing and unlimited supply of water for irrigation.

The perfect climate of the Land of Sunshine.

A rich, inexhaustible soil, peculiarly adapted to successful fruit growing, and producing abundantly all the crops that flourish in the temperate zone.

Long and reliable growing seasons.

Unequaled opportunities for the small farmer, fruit grower and truck gardener.

Close railroad connection with large markets.

Prosperous, well governed towns and villages.

Well managed schools and ample educational advantages.

A reasonable tax rate.

And all the advantages of a new country where land, now cheap, may be transformed by labor alone into valuable property yielding rich returns.

LOCATION AND AREA. San Juan County occupies the northwest corner of New Mexico. On the north it is bounded by La Plata County, Colorado, on the west by Arizona, on the east by Rio Arriba County, and on the south by McKinley County, N. M. The county is 90 miles east and west along its northern boundary and 70 miles north and south. It contains 5,742 square miles, about 3,675,000 acres, of which about one-third, or 1,980 square miles lies within the original Navajo Indian Reservation. About one-seventh of the area, or 820 square miles, was added to the Navajo reservation by executive order of President Cleveland. An additional 170 square miles is included within the Southern Ute Indian Reservation, but much of this land has been allotted and is available to white settlers. It is the announced intention of the Government eventually to allot the lands within the Navajo reservation. A considerable area of land has been withdrawn from entry because of the existence of coal thereon. Approximately 300,000 acres have been taken up under the United States land laws, so that there are now open to entry approximately 1,250,000 acres.

Some idea of the area of San Juan County may be gained from the fact that it is four and one-half times as large as the State of Rhode Island, three times as large as Delaware, and contains 900 square miles more than the State of Connecticut.

TOPOGRAPHY, GEOLOGY, SLOPE AND SOIL. San Juan County presents the appearance of an immense, irregular basin, through the lowest part of which flows the San Juan River. More than 125 miles of the course of this stream lie within its limits. The San Juan, Pine and Animas Rivers enter the county at an altitude of about 6,000 feet. Largo and Chaco Canyons have about the same elevation, while the La Plata River enters at an elevation of about 5,800 feet. The lowest point in the county, 4,800 feet, is where the San Juan River flows into Utah. The highest points are in the Chusca, Tunicha and Cariso Mountains, many of the peaks in these ranges reaching an altitude of more than 8,000 feet. High table lands or mesas are encountered along the northern, eastern and southern borders and in the northeastern portions of the county. The central portion is an immense plain which will eventually become a great agricultural region. Of the total area of the county, experts assert, about four-fifths is subject to cultivation.

Of the geology of the mountains within the Navajo reservation lying along the western boundary of the county, little is known. Outside the reservation the country rocks are of sandstone, usually called "white". These rocks are of a very recent geological period, are universally soft, easily handled in excavation and naturally, easily eroded. Some intrusive rock is found in the western portion of the county. Interspersed in the sandstone in many places are veins of coal and bodies of shale, marl, and many kinds of clay,

The San Juan and Animas Valleys, Looking West Three Miles from Their Junction.

while the water flow has carried down quantities of quartzite and other boulders, along the water courses. Erosion has been extensive, leaving long stretches of comparatively level mesas, which, as a rule, drop suddenly to lower levels. The waterways have worn canyons with precipitous walls of from a few feet to a thousand feet, many of which are wide enough to form attractive valleys.

With its mesas and valleys carpeted with grasses and sage, the hills and slopes covered with pinon and cedar, the whole cut by miniature "grand canyons" and surrounded on every side by towering mountains, the great plain of San Juan County forms a magnificent panorama, unrolling to the eye possibilities of development that are almost staggering.

The slope is mostly to the north and east, the ideal slope for fruit growing and agriculture, since the rays of the almost continuous sunshine of the long growing season of this southern clime strike less directly.

The soil, generally carrying a reddish tint, is of a rich, loamy character, abundantly supplied with potash, phosphorus, humus, nitrogen and the other plant foods. In fact, a careful analysis of San Juan County soils has shown that they are adapted to the suc-

cessful cultivation of practically every product of the temperate zone, being particularly favorable to all forms of horticulture. Very little alkali is found and that only in low spots where proper drainage is lacking. When water is applied this soil becomes the most productive, as to quantity and variety of products, of any section in the Southwest. Even the powdered sandstone, when irrigated, has been found to produce abundant vegetation.

Main Street, Farmington, Looking East

Range. There is still a vast extent of open range in San Juan County, affording excellent forage. Hundreds of thousands of cattle, sheep and horses range the year round. Very little winter feeding is done and none is necessary except where cattle are being fattened for the market.

Climate. The climate of San Juan County, like that of all New Mexico, is ideal. Although dry and warm the air is always invigorating, owing to the high altitude. The winters are short and mild, while in summer the nights are invariably cool and the warmest days are tempered with a breeze. High winds are infrequent, occurring only in the early spring. They are never sufficiently violent to prove destructive. A cyclone or tornado has never been known. The heaviest snow fall on record, outside of the high mountains, is only a few inches and it is very rare that a fall of snow remains on the ground more than a day. Of the 365 days the average during the past ten years shows more than 200 absolutely cloudless days; for about 120 days clouds may be seen in the sky and from 30 to 40 days are cloudy. The average annual precipitation is from 12 to 14 inches. The dry climate is peculiarly adapted to the needs of sufferers from pulmonary complaints, catarrhal affections and asthma. Asthmatics find almost immediate relief, while many remarkable cures of consumption are on record. There is no malaria: the ground is dry and it is possible to live out of doors with safety and comparative comfort the year round. As in almost all sections of New Mexico, consumptives are finding health and strength in outdoor life in San Juan county. In the early stages of consumption a cure is almost certain in this climate, provided the patient has proper nourishment and care and follows right methods of living.

San Juan County's Inexhaustible Water Supply. San Juan County's greatest asset is its abundant and unfailing water supply. No shortage of water has ever been known since irrigation was first employed and were it possible to divert the entire annual flow of the San Juan River it would be sufficient to inundate the entire county a foot and a half deep.

The San Juan River which is the county's principal stream, has its sources in the San Juan, Needle and Oso Mountains along the continental divide in Colorado. Its waters empty into the Colorado River in Utah and find their way to the Gulf of California and the Pacific Ocean. The river drains more than 3,000 square miles of territory at and above an elevation of 8,000 feet, some of the peaks in its drainage basin rising to a height of 14,000 feet. The reports of the United States geological survey and Weather Bureau show that the San Juan delivers above the mouth of the Animas, about 2,000,000 acre feet of water annually, or water sufficient to cover 2,000,000 acres of land a foot deep with water each year. A very small portion of this water is now being diverted for irrigation. The San Juan is the combined flow of eighteen perennial streams and is fed during freshets by innumerable "dry arroyos."

The Animas River is the combined flow of fourteen perennial streams, drains an area of more than 1,500 square miles at and above an altitude of 8,000 feet and its annual delivery of water at its junction with the San Juan is about 1,400,000 acre feet.

The La Plata River drains the La Plata mountain region in Southwestern Colorado, the mountains rising to an altitude of 13,000 feet. Its drainage basin is approximately 300 square miles and its annual delivery of water into the San Juan averages 200,000 acre feet.

Irrigation and Irrigable Lands. It is a well established fact that the richest and most productive lands in the world are those which are artificially watered, or irrigated. This is being proven true in the United States, where an acre of irrigated land is being made to produce, by intense cultivation, more toward the wealth and food supply of the nation than ten acres farmed by the natural method. The first cost is greater, but the reward is a certain and abundant crop; an utter independence of weather conditions, the

(1) Ranch of N. Smith, Hood Post Office. (2) A Typical Young Orchard. (3) Fisherdicks'—La Plata. (4) Store at Pendleton.

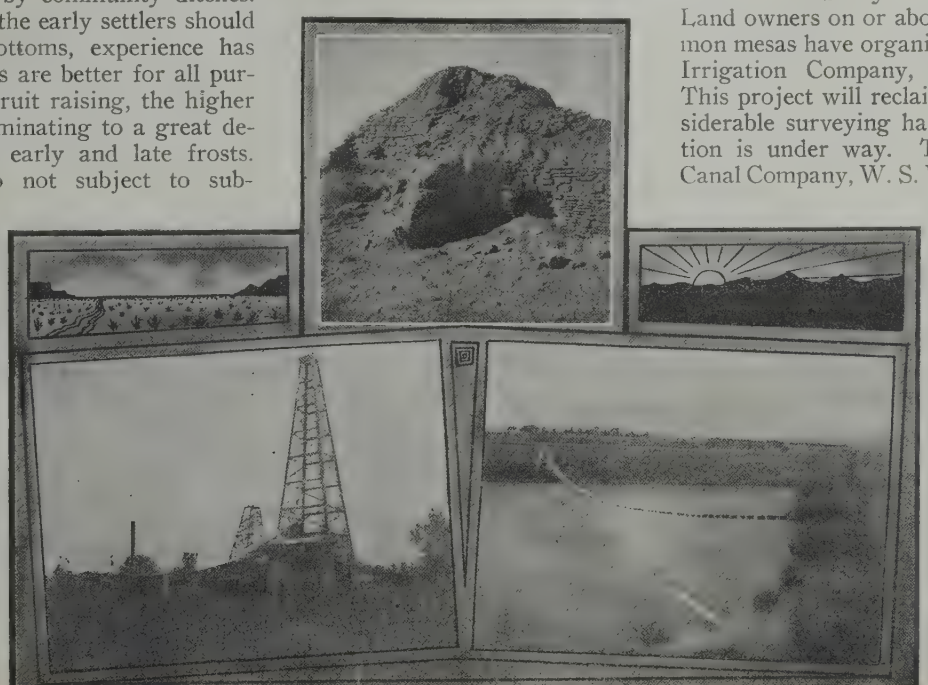
source of so much worry to the average farmer in the middle states, and an inexhaustible soil, since the soil is being constantly enriched by the deposits of silt suspended in the water which is poured over the land. Irrigation, however, means a small farm and intense cultivation. While there are many 160-acre farms in San Juan County and some even larger, the most successful farmers and fruit growers are those who confine their attention to the thorough cultivation of a smaller tract. Forty acres of land, well cared for will yield a net return of from $50 to $200 an acre each year. A ten-acre tract of bearing orchard, well cared for, will keep one man busy and yield him an independent income. If he chooses to make himself an expert fruit frower and tends to business he will become moderately rich.

Irrigation in its larger phases, presents its problems in San Juan County as it has done and is doing in every irrigated district in the world. These problems are now engaging the attention of experts. Some of them have been solved and others will be before many months have passed. Because of topographical conditions the waters of the San Juan River cannot be easily or cheaply diverted upon adjacent lands, above an elevation of 5,800 feet. On the other hand, the Pino, the La Plata and particularly the Animas River can each be diverted in Colorado above the 6,000 foot elevation, carrying sufficient water to successfully irrigate the higher lands of the county. It will be readily seen by reference to U. S. Topographical charts, that about half the area of the county lies below the grade lines of the high line canals, surveys of which have been pronounced practicable. Of this area, fully a million and a half acres are irrigable and subject to cultivation, the remainder being waste lands.

First National Bank, Farmington

Irrigation Works in Use and Projected. Irrigation was first attempted in San Juan County some twenty-five years ago, in the vicinity of the trading posts. Naturally these first farmers held close to the rivers, using the land in the first bottoms, or immediately adjoining the rivers. As the country has settled up these first ditch systems have been extended until community ditches have been constructed which irrigate much of the tillable land in the first bottoms. Some of the land on the second bottoms has now been brought under irrigation by community ditches. While it was natural that the early settlers should locate along the river bottoms, experience has proven that the mesa lands are better for all purposes, and especially for fruit raising, the higher location of these lands eliminating to a great degree the danger of both early and late frosts. The higher land is also not subject to sub-irrigation. In the first construction of the community ditches the farmers owning adjoining lands associated themselves together as a community ditch company to construct a ditch carrying sufficient water to irrigate their respective lands. The shares of water were then divided in proportion to the amount of land each held for irrigation. Each farmer in this way obtained his water right under this particular ditch. The water right goes with the land and is perpetual, as any other improvement. Water rights, of course, can be divided, transferred or sold separately from the land or attached to other lands by deed or transfer. The only expense connected with a water right in one of these community ditches is the amount of work and expense necessary each year in keeping the ditches in proper repair. The average cost of a water right for 40 acres ranges from $10 to $25 and averages from $15 to $17. It was through this community system of construction that irrigation was introduced in San Juan County and the bottom and some of the first mesa lands reclaimed. There are a large number of these ditches now in use.

San Juan County offers numerous feasible irrigation projects and as the demand for irrigated land has grown, capital has become interested and more is constantly being attracted to these projects. At present there are a number of projects under way to reclaim large portions of the unwatered land. One of these will reclaim about 60,000 acres north and west of the Animas river. The Turley brothers are constructing a ditch that will reclaim 2,500 acres south of the San Juan and east of Canon Largo. Land owners on or about the Bloomfield and Salmon mesas have organized the Citizens' Ditch and Irrigation Company, C. E. Spath, President. This project will reclaim about 6,000 acres. Considerable surveying has been done and construction is under way. The New Eden Land and Canal Company, W. S. Walker, General Manager, is now making surveys for a project which will reclaim 50,000 acres south and west of the Animas and north of the San Juan River. The largest project now under way is being promoted by Jay Turley, C. E., who has acquired rights and franchises and completed extensive surveys in connection with a plan to reclaim 100,000 acres of land east of the Navajo reservation. All these projects and a number of minor ones are to be carried out in the im-



Oil Well Near Farmington. Ancient Ruins Near Farmington. Foot Bridge Over San Juan at Farmington.

mediate future, the projects now under way reclaiming an acreage that will more than treble the area of irrigated land in the county.

DEVELOPMENT. The county offers numerous other feasible irrigation projects which are likely to attract capital in the near future. It may be said that San Juan County was not discovered until about thirty years ago, when the first settlement was made. Prior to that time sheep and cattle had been ranged over some portions of the county and Indian traders had found their way across it and onto the Navajo reservation, but there were no permanent settlements by white men.

Fruit Packers at Work—Orchard of Mrs. Agnes Currie, Near Farmington

As has been said, the first settlements were along the rivers and at the present time only the river valleys and a few small mesas are taken up, there being only about 100,000 acres under ditch, of which 25,000 acres are in actual cultivation. Of this from 3,000 to 4,000 acres are in fruit and vegetables and the remainder in alfalfa and grain. When the county's vast irrigable area and enormous water supply are reclaimed it is easy to see the possibilities of future development and why the irrigation projects mentioned above, are but the beginning of an era of advancement which will make of San Juan County one of the richest and most populous communities in the West. There is as much water flowing annually through this one county as flows in all the rest of the streams in New Mexico combined. There is as much water flowing annually through this county as flows through all of Arizona, with the exception of the flow of the Colorado River, and more water flows through the county annually than is carried by the combined flow of the Platte, Arkansas and other streams that irrigate the country tributary to Denver, Colorado Springs and Pueblo. In the land of irrigation, water is the vital power, and San Juan County has water without limit. The development of the county has just commenced. The largest town in the county has a population of less than 1,000 and the area under actual cultivation is only 25,000 acres. Yet here is the land and here is the water to provide homes for a population of half a million. San Juan County is the land of opportunity for the homeseeker.

MARKETS. The farming districts of San Juan County are favorably located for the marketing of everything the land will produce. Immediately adjoining the county on the north are some of the largest mining camps in the West, those constituting the Durango district. These camps afford a ready market for fruit, poultry, butter, eggs, vegetables and alfalfa. The Denver and Rio Grande Railway operates a standard gauge line from Durango through Aztec and the principal farming districts to Farmington, affording quick connection, while the line to Denver and Pueblo affords a ready outlet for all classes of fruits, garden truck and produce to the East.

The Arizona and Colorado Railroad has completed surveys for a line from Durango, through the county to the mining camps of Southern Arizona and this, when completed, will afford another outlet with large markets not only in Arizona but in Central New Mexico and to the Pacific Coast.

At Farmington are roller mills affording a local market for wheat, and a canning factory which buys all grades of fruit and tomatoes suitable for canning. Apple buyers and buyers of other fruits come into the county each fall and buy the fruit delivered on the cars at the nearest station. The supply of small fruits, eggs, poultry and butter, has never been equal to the local demand and prices have always been high. There is a ready market for all classes of live stock at highest market prices. Alfalfa sells at from $5 to $7 per ton in the stack with an ever ready market, while potatoes find a market in the adjacent mining camps and always at high prices. There is, in fact, a steady and dependable demand for everything grown in the county and this demand is constantly increasing.

PRICES OF LAND. In San Juan County as elsewhere prices of land vary according to location, improvements and the usual conditions governing the value of real estate. Irrigated farms under ditch sell at from $35 to $200 an acre. Raw land not under ditch, where title can be given, sells for $5 an acre or less. Claims of locators under the desert land act can sometimes be bought for less. According to location, the cost of bringing land under a dependable irrigating ditch costs from $5 to $25 an acre. Water rights go with the land and the cost of maintenance is nominal. To pay $200 an acre for land in a new country may sound large to a farmer from the East, but when the productivity of the soil and the certainty of the crop is considered, as well as the ample water rights which go with the land, the price is cheap. A careful study of the income now being derived from land of this kind by San Juan County farmers, as set forth on another page, is the most convincing proof that land in San Juan County is worth the money.

San Juan County "Dollar Makers"

LANDS SUBJECT TO ENTRY UNDER U. S. LAWS. A major portion of the land in San Juan County, and the best of it, is still open to entry under the Homestead and Desert Land acts. Practically all of the vast area lying south of the San Juan River is government land, some of it still unsurveyed, while north of the Animas River are large tracts. Still more government land lies north of the San Juan and west of the La Plata. In all more than 1,250,000 acres of land are still open to entry in this county.

THE FUTURE. To the man who is familiar with its resources and the conditions now existing, the future of San Juan County is very plain. Nature has been generous in her gifts to this favored section. Millions of acres of fertile land, a water supply for irrigation absolutely without limit, the most perfect climate on earth for health and successful labor in the fields, fuel and building materials in abundance and to be had for the asking; these are a few of Nature's gifts to San Juan County, New Mexico.

Land is cheap in San Juan County now. Much of the best of it is to be had for the mere trouble of filing on it with homestead or desert land entry. It is a condition which of necessity cannot continue for long, for a land of such opportunity cannot long remain undiscovered and the homeseekers have discovered San Juan County. But while it does continue this county offers an unparalleled opportunity to the homeseeker to secure an ideal home and by industry and well directed energy to insure for himself and his posterity moderate fortune. The homeseekers are coming in ever-increasing numbers. Within three years the population of the county will have increased six fold. Those who come first will have the choice of the land and will grow in wealth with the inevitable development of this richest section of the great Southwest.

Packing Apples in San Juan County Orchard, New Mexico

HORTICULTURE. Horticulture is destined to be the principal industry of San Juan County. The combination of warm days and cool nights, perpetual sunshine, abundance of water and the especial adaptability of the soil makes of the San Juan County fruits, particularly the apple and the peach, the most beautifully colored and most delightfully flavored fruits grown in the United States. These fruits continually bring highest prices in Eastern retail markets, while they have taken prize after prize at expositions and fairs, great and small. The apples grown in San Juan County are chiefly what are known as the winter varieties, and keep until the following July. The fruit is firm and the orchards are exceptionally free from injurious insect life. The southern latitude brings an early spring and a late autumn, insuring against the killing frosts that so often injure or ruin the fruit crops of the country a little further north. A twenty-acre fruit farm in bearing orchard will yield the careful fruit grower an income of $5,000 a year. On another page is given a brief statement of some of the results obtained by fruit growers last year (1907). The figures are convincing; they are the actual results in a year, when owing to unusual conditions, the fruit crop was the smallest it has been for many years. There is a ready market for every pound of fruit that can be grown in the county.

NEW MEXICO THE LAND OF OPPORTUNITY. San Juan County is but one of twenty-five counties in New Mexico, now developing with marvelous rapidity. The area of land under cultivation in New Mexico has more than doubled in the eighteen months up to January 1, 1908. In that period the population increased one-fourth. Ninety new post offices and thirty new banks were established. Twenty three thousand (23,000) homestead entries were made. The assessed valuation increased more than $5,000,000. All New Mexico, just as is San Juan County, is the land of opportunity toward which the homeseekers of the Nation are now turning.

Picking Apples in San Juan County Orchard, New Mexico

SOME ACTUAL RESULTS FROM SAN JUAN COUNTY ORCHARDS, FARMS AND TRUCK GARDENS FOR LAST YEAR.

The following are a few examples of actual results from San Juan County orchards, farms and truck gardens in 1907. In considering these results it should be kept in mind that owing to an unusual late frost—the first known since the county was settled—the year 1907 was not favorable to large production from the orchards, although the reduced crop had a tendency to somewhat advance prices for all fruits. These statements have been carefully verified and may be substantiated by reference to any of the owners mentioned.

Some Results in Apple Growing. A Sever and sons, of Flora Vista have seven acres of apple orchard. Two acres are planted to summer varieties and are not included in this summary. From the remaining five acres of winter varieties this orchard produced 2,924 boxes of apples, sold at $1.50 per box or $4,386.00, an average of better than $800.00 per acre. Of the 2,924 boxes sold, 2,246 were from Ben Davis trees. A single Ben Davis tree in this orchard produced 40 boxes of apples.

S. W. Wightman of Farmington has a single acre of Rome Beauty and Winesap apple trees. From this acre he picked 545 boxes of apples which sold for $1.95 per box or $1,062.75. A single Rome Beauty tree in this orchard produced 13 boxes and a single Winesap tree 12 boxes.

R. H. Woods, three miles east of Farmington, has twenty acres in orchard. Fourteen acres are in peaches and summer apples not yet in bearing. From the remaining six acres of winter varieties 2,678 boxes were sold in 1907, at an average of $2.05 per box, or $5,489.90. In addition 300 boxes of culls were sold at $1 per box; total revenue from five acres, $5,789.90, an average of close to $1,000 per acre.

Mrs. Lucy Hoyle, of Aztec, sold from 180 trees 2,000 boxes of apples at $1.55 per box, or $3,100.00.

From an orchard which he bought in 1907, O. W. De Remer, of Cedar Hill, sold 1,000 boxes of apples at $2 per box.

From a single Ben Davis tree in his orchard at Flora Vista, J. D. Gay picked 33 boxes of apples which sold at $1.65 per box. This orchard produced $2,000 worth of apples in 1907.

The Blanchard ranch, south of Aztec, has 400 young trees of which 100 are in bearing. These 100 trees produced 630 boxes of apples which sold at $1.50 per box.

H. A. Goodberlet, near Aztec, from 100 trees, sold 1,425 boxes of apples at $1.50 per box, or $2,137.50. The peaches and vegetables sold from this ranch brought its revenue for 1907 up to $2,700.

F. T. Hickman, of Flora Fista, sold 1,000 boxes of apples from three acres of orchard, at $1.50 per box, an average of $500 an acre.

J. I. Davis, of Flora Vista, from three acres of orchard, sold 1,100 boxes of apples at $1.75 per box, or $1,925, an average of better than $600 per acre.

R. J. Chambers, of Flora Vista, from four acres, sold 900 boxes of apples for $1,350.

C. H. Wood, of Cedar Hill, from two acres of orchard, sold 900 boxes of apples at $1.65 per box, or $1,485.

C. M. Tomkinson, of Flora Vista, from one-half acre of orchard sold 400 boxes of apples at $1.65 per box, or $660, an acre average of $1,200.

G. W. McCoy, of Aztec, from about four acres, produced 4,424 boxes of apples sold at $1.50 per box, or $3,635, an average of about $900 an acre.

C. W. Cameron, of Aztec, from three acres of orchard, sold $1,000 worth of apples.

J. E. McCarty, of Farmington, from six acres of orchard sold 2,200 boxes of apples at an average of $2 per box, or $4,400, an average of $700 an acre.

George Brett, of Flora Vista, from one and one-half acres sold 1,000 boxes of apples at $1.50 per box, or $1,500.

On a 100-foot lot in Aztec, which he bought for $300, H. D. Abrams has a few Gention trees. From these trees in 1907 he sold $175 worth of apples.

Some Results in Peach Growing. From 14 young Elberta peach trees, George A. Tinker, of Cedar Hall in 1907, sold $312 worth of fruit, an average of better than $22 a tree.

George E. Allen, of Farmington, from one acre of five-year-old Elberta peach trees sold $1,300 worth of fruit. From a two and one-half acre farm planted in peaches, grapes and tomatoes his receipts were $2,300.

Some Potato Results. George Fansher, south of Aztec, in 1907, sold 600 bushels of potatoes from one acre of ground. In pounds, this acre produced 36,000, which sold at $1.25 per hundred, or $450 for the crop.

C. B. Hume, north of Aztec, from an acre of ground, produced 21,700 pounds of potatoes, which sold at the same price, or $271.25 for the acre.

A Fair Showing in Tomatoes. D. F. Rickets, of Aztec, in 1907, planted half an acre to tomatoes. This half acre produced 526 twenty-pound boxes of tomatoes for which he received net $140.

A Good Sized Crop of Onions. George Brett, of Flora Vista, in 1907, from half an acre of onions sold 10,000 pounds, which returned him $125.

(1) Residence of L. G. Eblin, Aztec. (2) Residence of H. D. Abrams, Aztec. (3) Residence of B. C. Vaughn, Aztec.
(4) Residence of T. A. Pierce, Aztec. (5) Methodist Church, Aztec.

The City of Socorro and Socorro County

SOCORRO, the largest of New Mexico counties, with its grand mountain masses, grass-covered plains and table-lands, its resources, river courses, climate and scenery, its inhabitants and history, is typical of the great Spanish-American Southwest, more so, perhaps, than any other county in New Mexico. Here the Titanic forces of nature, seemingly, have had their playground, for they reared mountain mass upon mountain mass, not running in parallel ridges but consisting of apparently independent groups and knots thrown up in a haphazard fashion until one-third of the county is mountain and there is scarcely a spot within its boundaries from which mountains can not be seen on every side. Here canyons, parts of which the sun seldom touches, carry the waters from the hills; arroys, or dry water courses, which becoming raging torrents after a rain, have made deep incisions in the loose soil; volcanoes in past ages have thrown up enormous masses of lava, covering many hundred square miles of land, forming caves and frozen billows, upon which vegetation finds but sparse subsistence; there are salt lakes reputed to be bottomless; vast stretches of grass-covered plains and laughing, fertile valleys; mountain torrents and perennial rivers; forests that cover large areas, and again, desolate alkali flats and barren plains. A wonderful county, indeed, rich in everything that mountain, mesa, and valley can produce; gold, silver, copper, lead, and other minerals; cattle, sheep, goats, and horses, and other live stock; orchards, farms, towns, a peerless climate, mineral springs, and scenery which can not be surpassed for grandeur or variety; a county developed only in a few spots and offering untold opportunities to those with capital to invest or with energy and intelligent effort to apply.

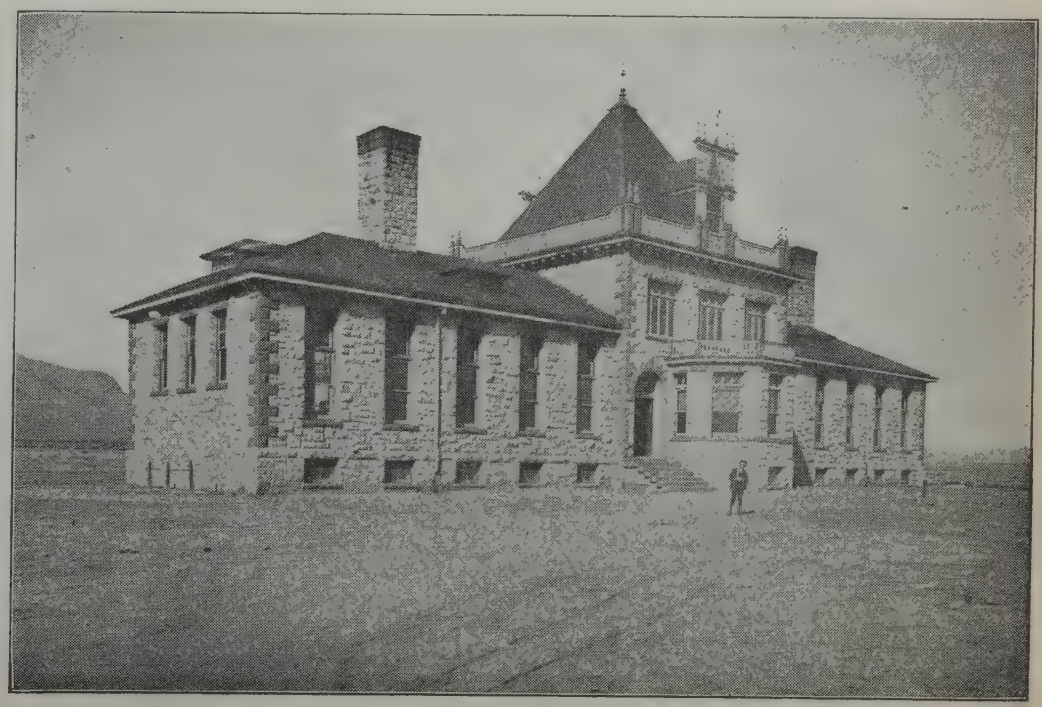
AREA AND POPULATION. Socorro County is bounded on the north by Valencia and Torrance Counties, on the east by Lincoln, Otero and Torrance Counties, on the south by Otero, Dona Ana, Sierra, and Grant Counties, and on the west by Arizona. Its area is 15,250 square miles, being fifteen times as large as Rhode Island, over seven times as large as Delaware, over three times as large as Connecticut, over twice as large as Hawaii or New Jersey, and considerably larger than Vermont, New Hampshire, Massachusetts, or Maryland. The States of New Jersey, Connecticut, and Rhode Island could be place in the county without taking up all its area. This great domain is but sparsely inhabited. The average population per square mile is but 0.8, and taking away the eight principal settlements the average population is but 0.4 per square mile. Settlements are far apart, and in several sections post offices are 40 to 45 miles from each other. Thus far many of the vast plains have no permanent habitations, only great herds of cattle and flocks of sheep traversing them from time to time or grazing peacefully upon them the year round, while the lonely mountains are uninhabited, except where mining camps have sprung up or where a prospector may have pitched his tent. It is for these reasons that Socorro County offers such great opportunity to the newcomer with capital, for the county is undoubtedly enormously rich in resources and can sustain many times its present population.

IRRIGATION. Socorro County has one extensive irrigation system under construction. This is an enterprise controlled by the Socorro Company operating at Elmendorf, in the Rio Grande Valley. Under this system, about 15,000 acres of Rio Grande Valley lands will ultimately be reclaimed. The ditches and laterals which served their purpose a hundred years ago are still doing service. There is room for the investment of capital in storage reservoirs and irrigation canals as well as in the development of water by means of pumping. In the American Valley a large storage reservoir is to be built, and a considerable area is to be brought under cultivation. There are about 25,000 acres under cultivation in the county, but there is water supply, if carefully husbanded and distributed, to irrigate twenty to thirty times that area.

LIVE-STOCK INTERESTS. It is in the live-stock industry, however, that Socorro County is one of the leading counties of New Mexico. Its ranges are vast in extent, and upon them graze 150,000 head of cattle, 50,000 head of horses, 15,000 goats, and some 250,000 head of sheep. The mild winters and the abundance of grass the year around make the live-stock industry very profitable.

TIMBER. The timber area of the county is principally west of the Rio Grande. The Gila Forest Reserve includes all the fine timber in the southwestern part of the county, in addition to large areas of agricultural and grazing land. But even outside of the forest reserve there are virgin forests of pine and other trees in the Frisco, Elk, Black, San Mateo, Magdalena, and Gallina ranges. There are probably 1,000,000 acres in the county covered with merchantable timber. But little has been done to exploit these timber lands.

MOUNTAINS. The continental divide runs through the county. The mountains of Socorro County are a part of the Rocky Mountain system, which here is splintered into many mountain ranges,



New Mexico School of Mines, Socorro

groups, and knots, the principal of which are the Oscuras, San Andreas, Tucson, San Mateo, San Francisco, Mogollon, Little Mogollon, Tularosa, Datil, Ladron, Manzano, Socorro, Lemitar, Magdalena, Black Range, and Bear Mountains. Most of these mountains have abundant indications of mineral wealth, which has been developed in but comparatively few spots.

MINERAL RESOURCES. It is probably as a producer of mineral wealth that Socorro County is best known. The names of the principal mining districts are Socorro, Water Canyon, Magdalena, Cat Mountain, Rosedale, Black Range, Cooney, Mogollon, Kelly, Oscura, San Andreas, Pueblo, Gallina, Santa Rita, Hansonburg, Abbey, and La Joya. The principal mining camps are Magdalena, Kelly, Rosedale, Mogollon, Cooney, Graham, and Estey City. There are nine stamp mills, two concentrators and three reduction works in the county. The City of Socorro was at one time a great smelter center for New Mexico, although in late years its smelter has been idle. The vast bodies of free-fluxing silver-lead ores in the Kelly and Mogollon districts have become famous in New Mexico's mining history. Large deposits of gold ore, much of it free, in Water Canyon, Rosedale, and in the Black Range, as well as rich copper discoveries in the Black Range, Oscura, and San Andreas mountains, have added to the fame of Socorro County as a mineral producer. Out of the Mogollon district $5,000,000 in gold have been taken and one or two of the best paying mines in New Mexico are in that district despite the fact that it is farther away from railroad facilities than any other mining district in New Mexico and that it became famous first as a silver producer. Several fortunes have been made by the mines at Kelly, 30 miles west of Socorro. Magdalena district, too, has been worked for quite a number of years and has produced a large amount of ore. Yet, the mineral wealth of Socorro County has scarcely been touched. There exist splendid chances for the investment of vast sums of capital and good rewards for the intelligent prospector and miner in every mining district of the county.

Mount Magdalena

SCHOOL OF MINES. The New Mexico School of Mines is doing great work not only for the mineral resources of Socorro County, but of the whole Territory. It offers a course in chemistry, metallurgy, mining and civil engineering equal to that of any other school of mines in the country. Short special courses are also offered, and they have much to commend themselves to the busy young man or to the prospector and practical miner. The board of regents of the college is striving to make the school the best mining college in the West, and has succeeded so far that no better school of mines is to be found in the Rocky Mountain region. The main building is very substantially built of stone and is modern in every respect. One wing of a new building has been completed to be used as a metallurgical building. The college possesses modern machinery for testing ores and treating them, modern apparatus for assaying, ore furnaces, and other equipment of an up-to-date school of mines. It is well endowed with public lands, the revenue from which, in addition to annual appropriations from the Territory, are used for the maintenance and permanent improvement of the college. The school strives to attract especially the promising young men of the Territory in order to make good chemists, assayers, mine superintendents, managers, and geologists of them, for there is no more promising field than New Mexico for the trained expert in mining.

RAILROADS. The Atchison, Topeka and Santa Fe Railroad cuts through the county from north to south, dividing it into two unequal halves. At Socorro a branch line 28 miles long extends to Magdalena. A line from Magdalena to the Black Range is projected and will open a fine mining and stock country to settlement. The projected Colorado and Gulf Railroad from Durango to Clifton, Ariz., or Deming, in Luna County is to cut through the western part of Socorro County.

The building of the Black Range and of the Colorado and Gulf railroads would double the population of Socorro County in five years, and would vastly increase its output of minerals, timber, live stock, and other products, as well as add materially to the value of its land and mining properties.

CLIMATE AND SCENIC ATTRACTIONS. Like the rest of New Mexico, Socorro County has a peerless climate that is of special benefit to persons suffering from throat and lung trouble. Its summers are never oppressive and its winters are milder than those of the counties to the north, and therefore to be preferred for certain cases of pulmonary complaints. The scenery of the county is beautiful and offers many attractions to the tourist who believes in traveling off the beaten routes.

THE GRAPHIC SMELTING WORKS AT MAGDALENA, NEW MEXICO LOOKING NORTH

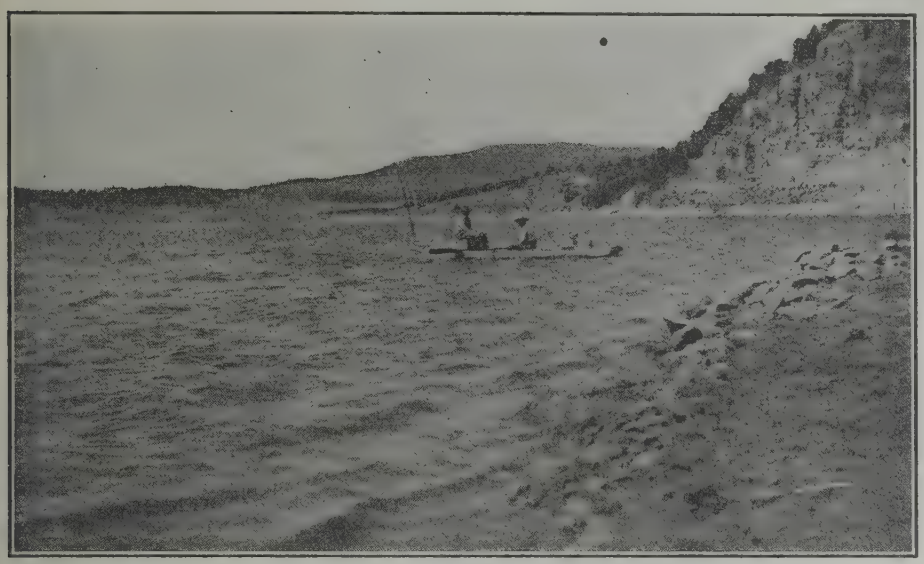
The Bluewater Development Company Irrigation Project

BLUEWATER, NEW MEXICO

By E. Z. ROSS

THE Bluewater and San Mateo Valleys comprising about twenty-one thousand acres, are located 107 miles west of Albuquerque upon the main line of the Santa Fe Railroad, and are now being extensively developed by the Bluewater Development Company of Albuquerque, New Mexico. There are two railroad stations within these valleys, Bluewater and Toltec.

The soil in these valleys is exceptionally rich and productive, and their development means much to New Mexico. For stock and sheep feeding they offer an ideal combination of cheap grazing lands in the surrounding foot-hills and immense yields of forage crops in the valleys under irrigation.



Scene on the Bluewater Reservoir

These lands are watered from a large storage reservoir with a total capacity, when completed, of ninety-two thousand acre feet of water, sufficient to impound two years supply of water for thirty thousand acres. The reservoir is located some twelve miles from the valleys and drains over 240 square miles of heavily timbered watershed with an average rainfall of approximately 18 inches.

Water is now impounded within this reservoir and many miles of canals constructed in the valleys. The outlet from the reservoir is by means of a tunnel, approximately 400 feet long and six feet square, driven through the solid rock at one side and not connected in any way with the dam. The reservoir site is known as U. S. Geological Reservoir No. 33.

The construction methods and equipment employed in the project are the latest and very best, the talent of eminent irrigation engineers.

The gate for the control of the reservoir waters is located in the center of this tunnel, and is operated from the gate house, which is located on the cliffs at the side of the dam, through a vertical shaft some 60 feet in depth. The dam is 386 feet long and when it reaches its full height will be 100 feet above datum. The first section is already completed.

The soil is a decomposed lava mixed with loam and is continually fertilized by wash from the limestone hills and lava beds surrounding the valleys. The valleys are completely sheltered and vary from one to six miles in width. There is no alkali in either soil or water.

Mr. W. G. Tight, President of the University of New Mexico, says: "The Agricultural lands of the company lie wholly in one of these basin-like filled sections. The soils, therefore, are very deep, and as they are composed of elements from the decay of sandstones, volcanic rocks and limestones, they are very fertile and light. They have the property of retaining their moisture so that not so much moisture is required for irrigation as on many other types of soil."

Mr. James J. Armstrong, of Denver, Colo., a recognized irrigation authority, also says:

"There was about twenty thousand acres of very fine land in sight which lays first rate for irrigation, quite as good as the best of our lands in Northern Colorado.

"After looking over the ground there can be no question as to the fertility of the soil. The whole valley is covered with a rank growth of weeds, excepting where it is covered with a heavy growth of wild hay or alfalfa. It is plain that with a good water service, heavy crops of all kinds can be raised in this valley.

"To sum up the whole situation I would say that there is an opportunity here for quite a large settlement with comfortable homes and profitable farming operations as the markets are close at hand."

Mr. A. J. McCune, former Colorado State Irrigation Engineer, expresses his opinion thus:

"The very fine quality of soil, the healthful climate, the abundance of building material and fuel and its cheapness, the abundance of free range for stock, continguous to the farming land on every side, will enable men with small means to make homes and build up valuable properties at a very small cost.

"It seems to me to be an excellent place to make a community of small stock growers and stock feeders. My observation for several years has been that stock growing under conditions as they appear to exist there, is the safest business for men of small means. Being on a through line of railroad, the facilities for shipping any of their products are good.

"The limited area of irrigable lands in that and contiguous territory will always give the farmer in that neighborhood a good market in the mining camps, government posts, and lumber camps adjoining.

Mr. George G. Anderson, Consulting Engineer, Member Inst. C. E., Member Am. Society C. E., Member Can. Society C. E., praises the valley in the following terms:

Irrigation Ditch in Bluewater Valley

Alfalfa Field in Bluewater Valley

"The soil throughout almost the entire irrigable area is a red clay, of uniformly good quality and great depth. The color is due to the presence of oxide of iron, a valuable constituent for crop producing, and, while the soil is of decomposed sandstone, it is not sandy in character. Both soil and sub-soil are extremely fertile.

"The soil is of a character that does not require much water for the propagation of crops, it is not lumpy, nor does it show signs of 'baking'. The soil conditions will result in a high duty of water, higher, in my judgment, than I have placed it elsewhere in this report, with the prospect of an extension of the irrigable area with a given quantity of water.

"The irrigable land presents, generally, a uniform surface, with gentle and regular slopes, well adapted for irrigation purposes.

"A wide range of products can be successfully raised, including cereals, alfalfa and other grasses, sugar beets, vegetables of all descriptions and the hardier fruits."

The report of Richard J. Hinton, Member American Society Irrigation Engineers, says in part:

"As to the fertility and adaptability of the soils and lands, under the Bluewater System, I have no hesitation in expressing an entire approval. As it lays out of doors, I have seldom seen 25,000 acres so perfectly adapted to irrigation as these. About one-half the acres —the Western section—consists of the famous red loam so eagerly sought after in our region. It is charged with mineral elements, deep, warm, easily worked, and retentive of moisture. This is largely the product of volcanic rocks. There is a distinct division between it and the lower, or gray limestone made lands.

The latter are excellent vegetable, grape, small fruit and forage lands. Both soil divisions are tractable, deep and readily watered and drained. The surface loam or deposits are from 15 to 30 feet in depth. Beneath the tufa or volcanic soil there is at about forty feet, a volcanic hard pan.

The limestone soils are underlaid with gravel and hard strata. Drainage waters for well use can be obtained in the volcanic or red soils at from thirty to forty feet. The sub-plane waters are about the same depth in the lime rock soils (admirably adapted for alfalfa.) In short, these soils will produce abundantly all the crops of the temperate zone. This will be found to be an excellent sugar beet section. All root crops, as well as grain, forage and leguminous products will thrive abundantly. The natural grasses are of the best. The range and foot hills furnish wild fruits, gooseberries, raspberries, Rocky Mountain cherries, plums, etc., in abundance. High altitude timber is ample for years to come, scrub oak, cedar, mesquite, pinon or scrub pine. Coal has been found within six miles. Mineral float has been found. Pine timber is near by. Fine limestone rock furnishes material for the kilns, and there are works in operation producing about 90 to 95 per cent pure lime. I noticed excellent building stone also."

The opinions of the authorities quoted above have all been verified by results obtained so there is no guesswork at Bluewater in regard to the conditions.

In the past five years over ten million people have visited the West and investigated its opportunities and the rush still keeps up. In addition to this it is stated by government authorities, that the setting of the sun every day for the past five years, has registered an increase in the valuation of the farms in the United States of nearly three million five hundred thousand dollars, and that in ten years there will be little, if any, agricultural lands in the United States that can be purchased at double the present prices.

Can you imagine anything else so absolutely certain of profitable returns as an investment? Is there any other industry in the world that can show such enormous and rapid increase in value with the ultimate exhaustion of the available acreage already in sight?

These are actual statistics, not guess work and prove beyond the shadow of a doubt that the man who acquires *now,* a piece of land susceptible of irrigation in the Bluewater Valley, has purchased a sure "cinch" by the very laws of nature itself. There is but a given quantity of land, and in reality, a given quantity of water in the United States and these are fast becoming depleted. There has been in the past an irresistible, steady, unhalting increase in value, even though there remained large quantities of tillable, yet uncultivated land. What will be the result when it's definitely known that all the available land and all the available water is appropriated? This condition will confront the United States within a very few years. "Time, Tide and Land Values wait for no man" is probably a better way of expressing the old and common phrase.

When financial distress overtakes the country, "Back to the Soil" is the cry and it is to the crops of the farmer that we look, for help and restoration to our former high pinnacle of commercial activity.

Mr. George M. Reynolds, one of the shrewdest bankers of the United States, at present head of the Continental Bank of Chicago, expresses aptly the sentiment of every well informed person in the United States today as follows:

"For the future we should watch, not the ticker, but the crop reports. There is the true measure of what is in store for us. With a great wheat crop in sight, with cattle and hogs and other farm values high, the farmer's prosperity is assured, and we of Chicago and the West, feel sure that business is safe as long as the farmer is safe.

We of the West have every reason to feel satisfied with the situation, not only as to the past, but as to the present and the future. It is impossible for us to be pessimistic if we would. Think of the great future that lies before all of the great country West of us, where millions upon millions of acres of land, now untilled, will soon be producing rich harvests. The future of this country, especially of the western part of it, will amaze the world as much as our past has astonished it."

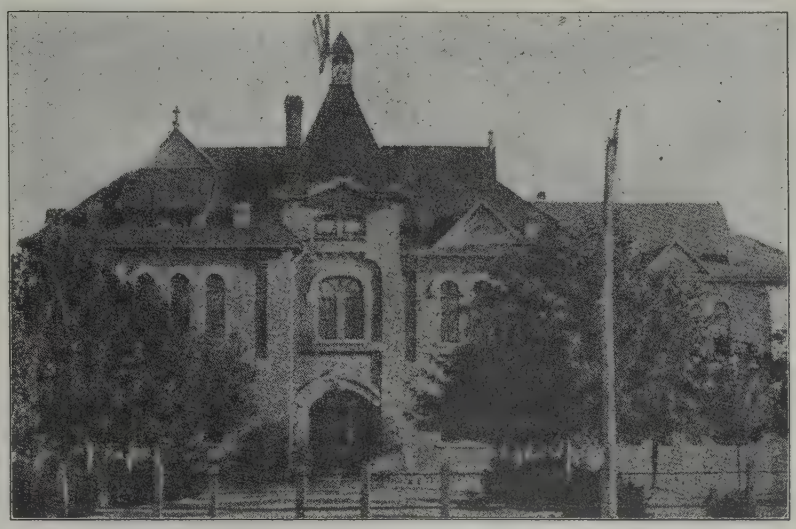
The relentless grind of ever increasing population, the necessity for food and homes will cease only with judgment day.

Bluewater Reservoir from Lower Side of Dam

Wealth of Deming and Luna County

By RALPH C. ELY

NEW MEXICO has scores of good towns and quite a number of booming towns; but among the substantial and uniformly reliable communities no town stands higher than Deming, and no county surpasses the County of Luna. Situated in the southwestern portion of New Mexico, including the drainage basin of the Black Range, the Cooks Peak range, the Burro Mountains and the Florida Mountains, with wide valleys of exceptional fertility, enjoying climate unsurpassed in all the West and blessed with water of extraordinary purity, we watch the growth of Luna County and Deming, its metropolis, with keen and confident interest. Its mines are rich in lead and zinc, with paying quantities of gold and silver, its hills and valleys sustain countless herds of well bred cattle, and its lands promise to provide the garden spot of New Mexico.



High School, Deming

A community can be best judged by the character of its schools. Deming has a school system of the highest order, offering twelve well arranged grades to the ambitious pupil presented by a corps of instructors selected with great care from all parts of the country by a Board of Education of exceptional judgment. The public school building, a picture of which is presented herewith, is a beautiful and commodious structure and is a monument not only to the community along educational lines, but evidences its thrift and conservatism in that the school district does not owe a dollar in connection with its erection.

During the past three years, this locality has attracted wide attention by the efforts put forth in the vicinity of Deming for the redemption of the land and its development along agricultural lines, this section leading New Mexico in the enterprise of pumping water for irrigation purposes. In and about the town are scores of homes nestling among the peach, pear and apple orchards or surrounded by little vineyards where the possibilities of future growth are being carefully tested by conservative men who realize the fertility of the soil, the excellence of the climate, the boundless water supply, and the unusual shipping facilities enjoyed by this thrifty town. The home shown on page 116 is not pretentious, but selected for illustration here as a fair example of the average home and what a little work will do, intelligently directed along these lines.

When the work of agricultural development first began there were those who felt that possibly this might interfere with the privileges so long enjoyed by the stock men whose herds have ranged at will upon these boundless plains; but among the very leaders in this work is to be found Mr. E. E. Burdick, one of New Mexico's wealthy stock men, who is tilling eighty acres of land unsurpassed in fertility; and irrigating the same with water pumped from a well by a centrifugal pump. Other irrigated farms are being developed by these men and the wealth of Luna County is being rapidly multiplied by the redemption of its plains.

Possibly no better illustration of the wonderful fertility of the soil and its quick response to the application of water could be found than is to be seen on the Lewis Flats where the flood waters of the Mimbres River have for years spread out upon the plains and sustained the growth of the native grasses. In an accompanying picture is illustrated a quantity of baled hay composed almost

entirely of gramma grass and sacaton grown on the Cook Hay Farm in this valley, which returns to its owner annually about $15.00 per acre without other expense or labor than that of cutting, baling and hauling the hay.

In some localities the sub-soil presents an obstacle to growth, but Luna County is confronted by no such limitation. The soil has been examined and tested for many feet through the digging of wells and in places it is known to be eighteen or twenty feet in depth without a change of character. About half a mile from the Town of Deming there is a Chinese garden which has been in cultivation for nearly ten years, and which is a marvel of thrift and resulting beauty. Years ago a portion of the land was used for a brick yard and an excavation possibly four feet in depth was made in the course of these operations. The present owners, not satisfied with cultivating the surface of the land, have worked up the bottom of this old pit and are today producing their daintiest garden vegetables nearly four feet below the surface of the ground. The picture accompanying this sketch shows the thrifty Celestial with his rake and his watering pots working in the bottom of this pit, and this should assure any person interested, that the wealth of Luna County's soil will not be exhausted by generations yet to come.

Possessing a soil of such exceptional fertility and depth with water of remarkable purity, a climate unsurpassed for agricultural purposes, and all conditions conspiring to a quick and bounteous growth at man's command, Luna County should become the garden spot of the New Mexico of tomorrow. An accompanying picture shows a portion of a field of sorghum sown three weeks before the picture was taken and in the middle of the foreground the ingenious photographer set a silver dollar upon edge as a basis of comparison of the remarkable growth of this plant.

Deming as a town is conservative and careful. The cheapness of crude oil as fuel for motive power has been pointed out to the people, and it is being used extensively in pumping water for irrigation, thus proving that this line of development will lead not only to the enrichment of their town and county, but likewise to the ultimate development of hundreds of thousands of acres of land throughout New Mexico. They believe in Luna County and they believe in New Mexico, and they are willing to do, and are cheerfully doing what lies within their power to develop the resources of this splendid domain. Endowed with rare natural advantages, peopled by men of courage and intelligence who sustain public institutions of the first order, possessed of the best shipping facilities in the whole Southwest, and struggling for the ultimate development of its highest possibilities, Luna County need not boast of its size, but confidently relies upon the quality of its growth and claims recognition as the most substantial and most livable community in New Mexico.

The Estancia Valley and Its Prospects

BEAUTIFUL, PRODUCTIVE, HEALTHFUL

THE ESTANCIA VALLEY, situated in the heart of New Mexico, is probably the most healthful valley in the United States. In reality, it is like the bottom and sides of a shallow saucer with a gentle ascent in every direction. The blue Manzano Mountains, the Gallinas, the San Pedro, the South, the Ortiz Mountains, the Pedernal, the Las Animas Hills, the Lobo and Tres Jumanes Mesas are the immediate boundaries of the valley, while in the north glitter the snowy peaks of the Santa Fe and Pecos ranges, for the valley is but a continuation of the plateau that stretches southward from Santa Fe to the Galisteo.

Ideal climate is in a large measure making Estancia Valley world-famous. The winters are mild and sunshiny, and the summers cool; statistics showing that better conditions, so far as health is concerned, cannot be found anywhere.

The resources are unlimited, the soil being especially well adapted to the growth and maturity of sugar-beets, alfalfa, wheat, corn, potatoes, apples, and in fact nearly all farm products, and good markets for everything produced within reasonable distances. The opportunities for raising cattle, hogs, sheep, and horses, with big returns positively assured in a pecuniary way are unlimtied. There is no doubt that the valley will prove a much better field for investment in the sugar-beet industry than other valleys which have sprung into such great prominence within the last few years, resulting in an enormous increase in land values.

An item of great importance is water, and good water is found near the surface of the land from one end of the valley to the other.

Aolng the boundaries of the valley are to be found thousands of acres of good number one timber land, valuable coal lands, extensive iron and salt deposits, gypsum, shale beds and limestone.

The valley is traversed by the New Mexico Central Railroad, running from Santa Fe, New Mexico, where it connects with the D. & R. G., and the A. T. & S. F., directly south to Torrance being crossed east and west at Kennedy by the main line of the A. T. & S. F.; at Willard by the A. T. & S. F. Railway "Cut-off" and connecting at Torrance with the E. P. & S. W. System, Rock Island and Frisco Lines; thus furnishing ample transportation facilities. The New Mexico Central Railroad is a standard gauge railroad of recent construction; service, equipment, power, track, and station buildings being modern and up-to-date in every particular. The management is lending every possible effort to advance the numerous interests now thriving along the line. This alone insures a wonderful future for the Estancia Valley. Farmers, merchants, and capitalists from all parts of the United States are coming into the valley in great numbers, developing its many resources so rapidly that small investments now are sure to bring great returns within a very short time. There is still vacant a large acreage of unoccupied government land to be homesteaded and a big field for commercial enterprises of all kinds requiring but a small investment; but prompt action must be taken before the opportunity gets away.

WIND MILL AND WATER TANK AT STATION 425
SHOPS AND STORE ROOM, ESTANCIA, N. M.
WAREHOUSE AND STOCK YARDS AT STANLEY, N. M.
STOCK YARDS AT ESTANCIA, N. M.

There are a number of most progressive and rapidly growing little cities in the valley; the largest, Estancia, the county seat of Torrance County, is located on the New Mexico Central Railroad, 68 miles south of Santa Fe, the Capital of New Mexico. Three years ago there were but a handful of people and a few cabins on the present site. Today it is a town of several thousand people, founded by farmers from Iowa, Illinois, Missouri, Kansas, Kentucky, Oklahoma, and Texas. A $10,000.00 court house is to be erected at once, bonds having been issued and sold for this purpose. A Board of Trade has been organized, and its school buildings, churches, etc., are substantially constructed of brick, stone, and native lumber. The New Mexico Central Roilroad shops are located here, employing a large force of men; the payroll adding materially to the success of the town.

Willard, rightly named the "Hub City,", is a thriving junction town, and has a most promising future and is now an important distributing point for a large section. It is almost in the center of this great Sunshine Valley, geographically and commercially, making it one of the busiest little cities in New Mexico. Willard began with the construction of the New Mexico Central Railroad and the A. T. & S. F. Cut-off, with temporary frame shacks which have since been replaced with solid brick, stone, and frame structures made necessary and possible by the unprecedented development of the valley.

STATION AT MORIARTY, N. M.
JOINT STATION WITH D. & R. G. SYSTEM AT SANTA FE, N. M.
STATION AT ESTANCIA, N. M.
JOINT STATION WITH E. P. & S. W. SYSTEM AT TORRANCE, N. M.

Moriarty, McIntosh, and Otto, are three coming towns in this magnificent valley situated in this fertile farming country from which they draw their trade. They are bound to grow, the

merchants and other business establishments enjoying the greatest of prosperity continually. The New Mexico Central Railroad has in course of construction the Albuquerque Eastern Railway, a line from Moriarty to Albuquerque, which in the coming few months will open up an extensive new territory of agricultural, mineral, and timber lands, and place this town and valley in close touch with the important city of Albuquerque and its many advantages.

The town of McIntosh is located between Moriarty and Estancia and enjoys all the advantages of its sister cities, has four general stores, a flour mill in course of construction, bank, real estate and land offices, and in fact everything that goes to make a successful business city.

Otto is another charming little town immediately north of Moriarty where a few stores, etc. can now be located to great advantage and at small expense.

Stanley is a small town progressing very rapidly, drawing a trade from and furnishing a market for its prospering farmers, and owing to the short distance of only 40 miles via the New Mexico Central to Santa Fe, has every prospect of becoming a city of importance.

Cedarvale and Torrance, at the extreme south end of the New Mexico Central Railroad, are just commencing to develop, and it is reasonable to suppose with the advantages in an agricultural and commercial way that Estancia Valley furnishes, capitalists and merchants will be attracted from all localities, particularly the East. Without any question of doubt the Estancia Valley along the line of the New Mexico Central Railroad is the very key to most that is best, attractive and interesting in the great Southwest and opportunities are unequaled for everyone

An excellent map of Estancia Valley, showing in detail its resources, railroads, etc., is to be found on inside of back cover of this publication, and an extra copy will be furnished free to anyone upon application to the New Mexico Central Railroad, Santa Fe, New Mexico.

FORTIER TELLS HOW TO IRRIGATE

Alfalfa is irrigated by means of borders and checks in California, checks in Oregon, and furrows in Washington. Even in such diverse methods there are features common to all. Young alfalfa is a very tender plant, and its early treatment must be such as to avoid caking the surface soil, too little or too much soil moisture, and too rank a growth of weeds. Irrigating very young alfalfa is ruinous in most soils. It must be seeded when rains or irrigation have supplied enough moisture to the soil to support the plant till it shades the ground. In Washington and Oregon a nurse crop is often used to advantage.

The best rule is to irrigate alfalfa in such a way as to allow no breaks in its steady growth. In some places this is best accomplished by irrigating as late as possible before cutting, and not after cutting. Where the weather is very hot newly cut alfalfa may be scalded if flooded, and some soils will bake very hard if watered when the soil is so little shaded. In other places it is the universal practice to irrigate after cutting.

The important point in irrigating beets is to have the land laid out with enough care so that no water will leave the furrows. Caking of the surface chokes the beet even after it is half grown, and will kill young plants. Caking may be largely prevented by using a small stream in a deep furrow. The usual practice is to turn five to ten miner's inches into each shallow furrow, and to assume the irrigation complete after one or two hours if the stream has reached the lower end. A better plan, in suitable soil, is to turn in less than one miner's inch, (a miner's inch is a little more than 11 gallons per minute), and permit it to run 12 to 24 hours. Deep cultivation between the rows is to be recommended, both in order to soak the water deeper into the ground and to give the beet room to expand laterally. In some porous soils it is an aid to irrigation to drag a log through the furrows before applying water, to compact the sides and bottom. Longer furrows can then be used.

The same general rules apply to the irrigation of potatoes and other root crops. The best potatoes are raised from seed grown on unirrigated land. Ideal moisture conditions are attained when the moisture around the roots of the potato is gradually increased until the plant blooms and the tubers are formed, and is then as gradually diminished until the crop is harvested. This ideal may be approached by skilful irrigation and thorough cultivation.

In irrigating vineyards as little water should be used as will produce normal healthy growth. Water should only be applied when persistent cultivation fails to conserve sufficient moisture in the soil. Irrigation is usually required for young vines in their first year of growth, and in later years when the mature vines yield heavy crops, spring irrigations are beneficial. The furrow method is recommended.

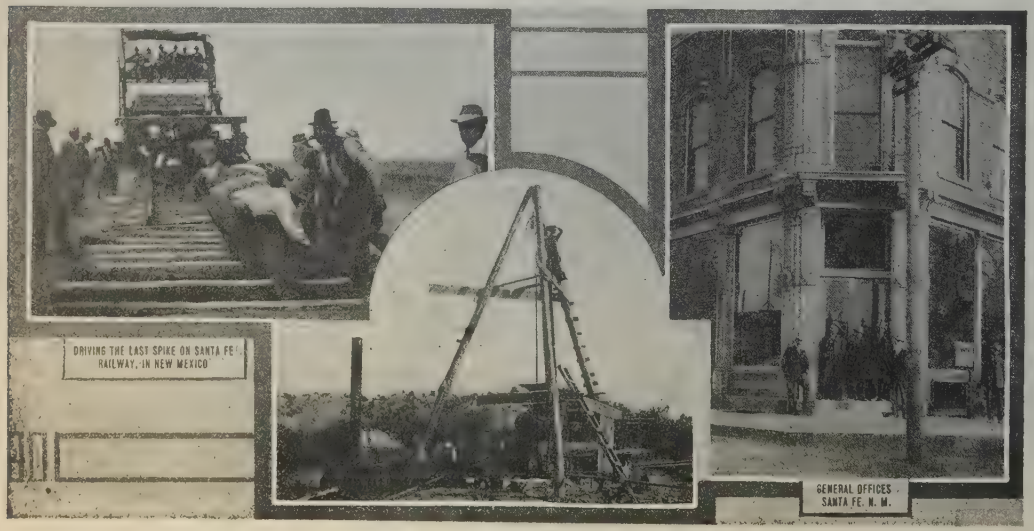
Orchards should not be set in any but deep and fertile soils, and in making suggestions as to orchard irrigation, such soil is assumed. The object of the orchardist should be to train the roots outward and downward, and this can be done by proper irrigation. In all warm localities the upper six inches or more of the soil should be kept as a dust mulch. Roots that are lured into this layer by the winter rains will later perish by drought. Hence the only proper way to irrigate is to apply the water in deep furrows with a considerable interval between irrigations, and to cultivate deep and often.

LAS VEGAS, NEW MEXICO, PROJECT

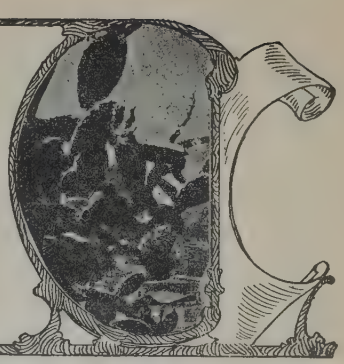
By the carrying to completion of the proposed Las Vegas Project in New Mexico, 10,000 acres would be irrigated. The plan is to take water from the Sapello and Gallinas rivers, Sanquijuela creek and Arroyo Pecos and store them in a reservoir in the valley of the Little Sanquijuela. The project is located at Las Vegas. At present stream measuring is about all the work that has been done upon it.

LA PLATA PROJECT

In the northwest corner of New Mexico is a proposed project under which 40,600 acres of land may be irrigated. It is known as the La Plata Project. It presents many discouraging difficulties, but the engineers of the service are trying to find ways by which this tract may yet be watered. The greater part of the land lies along the La Plata River, a tributary of the San Juan. It is proposed to irrigate it by a diversion from the Animas river or by storage reservoirs conserving the entire run-off. Under the former plan, a tunnel three miles long would have to be driven and the main canal would have to be built at great expense through a very rough country. This is looked upon as impracticable. The plan of running the flow into one of the natural waterways directly upon leaving the tunnel has been considered. Several reservoir sites have been found, but none of them has a very promising location.



NEW MEXICO PROJECTS



Roswell and the Far Famed Pecos Valley

The Roswell Country of New Mexico—Terse Paragraphs About the City

ROSWELL is in the southeastern part of New Mexico, in the center of a green valley. Uplifted 3,600 feet above the level of the sea, the altitude assures immunity from malaria or chills, and still it is not so high up in the clouds as to cause discomfort from the attenuated atmosphere.

Nature has done, for the country around Roswell, all that a man could ask, though man has been a long time in learning to appreciate her munificence. Now the knowledge is spreading, and the landscape is a varied green. Fields of alfalfa and great orchards of big, red apples and juicy pears are seen on every side, where but a few years ago, were open cattle ranges, to be bought by sections at a few dollars per acre. Much of the land is still uncultivated. Nearly a half million acres are unimproved, and await the hand of the farmer from the East and North, to make it blossom as the rose.

Roswell has three excellent hotels.

Roswell has a good government league.

Roswell has two modern steam laundries.

Roswell has a modern cold storage plant.

The altitude of Roswell is 3,570 feet above the sea level.

The freight tonnage of Roswell is around 20,000 a month.

It is illegal to spit on the sidewalks or in the public places of Roswell.

Roswell has two newspapers, one daily and the weekly Register-Tribune.

Owing to the purity of the water supply, enteric and malarial diseases are practically unknown in Roswell.

Roswell has a $40,000 sewer system, supplemented by an underlying drainage system.

Practically all of the real estate dealers of the city are united in the Roswell Realty Board.

Roswell has three national banks, doing a combined business of $2,000,000, with perfect appointments.

The mean annual temperature in Roswell is 70.1 degrees, the mean annual rainfall 20 inches, in round figures.

The regular educational equipment of Roswell is supplied by an excellent kindergarten, while later on a school for girls is practically assured.

Roswell has free mail delivery, the people being served by four carriers, and a splendidly organized office force under Postmaster Robert Kellahin.

There are over 50 miles of cement sidewalks in Roswell, more in proportion to the size of the town than in any other city of its size in North America.

House rent in Roswell does not vary far from $5 per unfurnished room per month, the variations depending upon the distance from the business center.

Roswell has an ordinance favoring the parking of the wider streets in the residence district, which improvement is well under way in a number of places.

Roswell has six saloons, which pay an annual license of $2,000, and the number of saloons can not be increased until there is a material increase in population.

South and West Highlands, now becoming popular residence sections, are supplied with water by private plants and by windmills and gasoline pumping plants.

Roswell has an up-town office of the Western Union Telegraph Company, and the field will shortly be entered by the Postal Telegraph Company from the north.

All Roswell mechanics work on the eight-hour schedule, and the wage scale varies from $1.50 per day for common labor to $4.50 for carpenters and other skilled labor.

Roswell is a great wool market, something like 2,000,000 pounds being sold here every year. A complete wool scouring plant is operated for the production of refined wool.

Cement brick and blocks are coming to be very popular building material in Roswell and the Hondo Stone Manufacturing Company enters largely into the manufacture of both.

Roswell has a prosperous and growing canning factory, which puts up all of the products of the soil, its output while steadily increasing not being sufficient to supply the demand.

Roswell has splendid streets and contributary country roads and these facts have been instrumental in the use of more than fifty automobiles, outside of the holdings of the Automobile Company.

Roswell has three ice plants, owned respectively by the Gas Company, the Haynes & Bonney interests and the Blashek family. The price of ice is around 60 cents per 100 lbs., less in large quantities.

Roswell has a progressive Lodge of Elks, who have now under way plans for the erection of a splendid theater and club rooms on the lots owned by the body at the corner of Second Street and Richardson Avenue.

Roswell has the unique distinction of being the only town in New Mexico in which 100 per cent of the taxes assessed are collected. This applies to county, city, territorial, special and occupation taxes alike.

Practically all lines of business are represented in Roswell, the wholesale houses being especially strong. This is caused by the fact that Roswell is the trade center of a stretch of country larger than most states.

Roswell has a splendid common school system, which includes two large grade buildings and a separate high school, under the direction of a splendid corps of teachers. Over 1,700 children are enrolled and there are 36 teachers.

Roswell has all of the branches of Masonry, up to the Knights Templar. The Blue Lodge is one of the strongest and wealthiest in New Mexico, owning its own temple, which is shortly to be very materially enlarged.

Roswell has a Carnegie library, secured through the efforts of the Woman's Club and supported under the city laws. The building is of cream brick, located one block west of the post office and is free to the use of everybody.

Owing to the universality of the great artesian wells, Roswell has no public water works system, all efforts to secure a franchise for the same having failed so far. An attempt to secure a municipal plant will be made this winter.

Roswell is the seat of the Federal land office under the executive direction of Howard Leland as register and Harold Hurd as receiver. This land office has been one of the most important in the Southwest, and has control of all of Southeastern New Mexico.

While nominally in the center of the so-called semi-arid West, Roswell is noted for the number and luxuriance of its shade trees. It is estimated that there are more than 2,000 shapely cottonwoods in Roswell, and the number is being constantly added to.

Roswell has a modern telephone system with long distance connections as far as Malaga on the south, El Paso on the southwest and Texas on the north. Over 500 phones are in use in Roswell and its suburbs. 1215 phones are accessible to each subscriber.

Roswell has one of the best electric light systems in the Territory, with a total capacity of 15,000 sixteen candle power incandescent lights. The company also has a large trade in current for motors, and supplies the city with thirty arc street lights of 2,000 candle power each.

The Sisters of the Blessed Mother (Catholic) have a splendid hospital at the south end of Main Street. Over $40,000 is invested in the main building and an annex for tubercular patients. The staff, taken altogether, is perhaps the strongest of any hospital in the Southwest.

Arrangements have been completed for the cementing of the irrigation ditches running through Roswell. The work is under way and is to be completed before the beginning of the next irrigating season, and the expense will be borne equally by the city and proprietary companies.

Roswell has flourishing Lodges of the Eagles, Knights of Pythias, Odd Fellows, Modern Woodmen, Woodmen of the World, Red Men, Maccabees, Ancient Order of United Workmen, Praetorians, Fraternal Tribunes and labor organizations embracing the carpenters, barbers and painters.

The grade of medical practitioners is probably higher in Roswell than in any other city of its size in the Southwest and practically all of the practitioners, except two homeopaths and two osteopaths, are allopaths and eclectics.

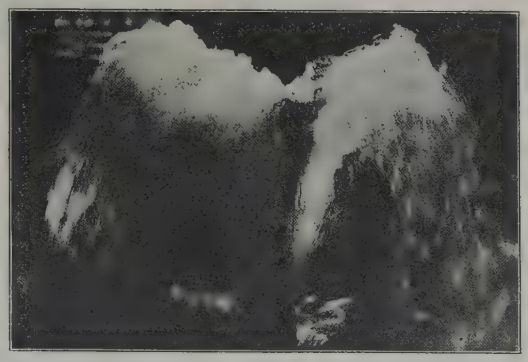
For governmental purposes, Roswell is divided into five wards, each of whom has two aldermen and two members of the school board. The city council is presided over by a mayor, and the city

1. Fifth Street, Roswell, N. W. 2. Thirty Miles of These Cement Walks, Roswell, N. M. 3. Apple Orchard, Roswell, N. M. 4. Forty Mile Canal, Roswell, N. M. 5. Artesian Well and Reservoir, Near Hagerman, N. M.

organization is complete. The city hall is located at the corner of Second Street and Richardson Avenue.

Roswell is 206 miles from Amarillo, 474 miles from Dallas, 377 miles from El Paso, 765 miles from Kansas City, 1023 miles from St. Louis, 1220 miles from Chicago, 681 miles from Denver, 2200 miles from New York, 106 miles from Torrance by automobile, 75 miles from Carlsbad, and only half a mile from heaven in the spring time.

Roswell has a first class gas factory, making oil gas. The plant of the company, at the corner of Pecos and Ninth is perfectly appointed with the best modern machinery, and mains are laid over practically all the city, excepting the hills, to which it will be extended in due course of time. The company is owned and operated exclusively by Roswell people, and supplies gas at $1.80 per 1,000 cubic feet.



Roswell is well supplied with churches; having flourishing congregations of the Catholics, Presbyterians, Christians, Baptists, Episcopalians, North and South Methodists, Seventh Day Adventists and the Salvation Army. All of these denominations except the Adventists have fine church properties, and are constantly increasing in membership and usefulness. All of the Protestant denominations are united under the Ministerial Association.

Roswell is the home of the artesian well and there are now more than a hundred of these fountains in the city. The first well touching the flow was struck on the residence lots of Nathan Jaffa on South Richardson Avenue, in March, 1891, without warning, as the well was simply being put down for portable water. The well at first tapped the first flow only, but was later extended down to the major vein, and is still one of the best wells in the city.

Artesian water is found anywhere in Roswell (and in the proven field for that matter) below the level of North Spring, at depths varying between 200 and 300 feet. The flow has a maximum volume of over 2,000 gallons per minute, a temperature of about 50 degrees Fahrenheit, and a relative purity of 100 parts of solids to the 100,000. The water has a normal pressure of six pounds to the square inch. There are over 100 artesian wells in the city, and besides giving abundant domestic and commercial supply it supplies the city with water for fire protection, something like sixty fire plugs being connected directly to wells. Artesian wells owned by the city also flush the sewer system.

THE HONDO PROJECT

Modern ditches, supplied with water from a magnificent river and the copious streams of many artesian wells are bringing the Pecos Valley in Chaves County, New Mexico, of which the beautiful City of Roswell is the metropolis, into an unrivaled state of productiveness. In addition to the water supply already developed, which has been sufficient to create many magnificent farms, the government is now ready to supply water from the Hondo reservoir. Rivers fed by streams and snow that lies deep on the mountains towering above the valley, will give a supply of water for all the lands that may be reached by the canals to be constructed. The conformation of the country is such that the engineers had no difficulty in locating reservoir sites.

The Hondo reservoir is twelve miles southwest of Roswell. The total cost of this project will be $275,000.00. The few obstacles that the government has to contend with in this place make it possible to obtain results beyond proportion to cost. The land to be irrigated is immediately adjoining the City of Roswell and has an area of ten thousand acres.

Because of the few obstacles to be overcome, the Hondo was among the first of the government irrigation projects to be completed. The cost per acre for the reclaimed area is $27.50, making the yearly installments only $2.75 to be returned to the government treasury. At the end of ten years no other payments are required.

The beauty of the Pecos Valley makes a strong impression upon strangers and is a continued pleasure to those who reside there. The climate is of the very best in the mountain country. There are beautiful driveways, lined with magnificent trees. Lofty mountains are seen one

1. Irrigation Ditch, Roswell, N. M. 2. Spring River, Roswell, N. M. 3. Farm Scene, Near Roswell, N. M. 4. The Largest Artesian Well in the World, Roswell, N. M. 5. Artesian Well, Roswell, N. M. 6. Orchard, Near Roswell, N. M.

hundred miles to the west. The mountains are full of game and the streams are full of fish. The most fruitful portion of the irrigated district of the Pecos Valley lies in Chaves County. It extends along the west side of the Pecos River and is nearly parallel with it. It is far from being an isolated section. It is brought directly into the world by adequate railroad connections. It is traversed by the Pecos Valley branch of the Atchison, Topeka and Santa Fe Railway, which extends from Pecos, Texas, on the Texas and Pacific Railroad to Roswell, busy center of the region's industry, a distance of 164 miles, and from Roswell in a northeasterly direction to Amarillo, Texas. By this means the Pecos Valley has an outlet to Eastern and Southern Texas and to El Paso and the West over the Texas and Pacific Railroad through Pecos; and to Colorado, Southern and Eastern Texas, Kansas City, St. Louis, Chicago and all the East through Amarillo. With the enlightened class of people that is populating it and its close touch with the world, the Pecos Valley and Roswell offer all the social and educational happiness and advantages that can be found in any progressive community.

1. Scene on Berrendo River, 3 Miles North of Roswell, N. M. 2. Roswell Wool and Hide Co., Roswell, N. M. 3 Irrigating Ditch, Roswell, N. M.

While almost anything in the way of a profitable crop will grow in the Pecos Valley, it is alfalfa that brings the quickest and surest money. It is the crop from which the new settler usually obtains his start and which makes him a good living while other crops that bring heavier returns are coming into bearing. Alfalfa means livestock and dairy products and these are a profitable source of income in any region where they can be produced successfully. It is said to be a wonderful region for garden truck and all sorts of fruits. Especially are apples grown in the Pecos in great abundance and of a quality and color that is said to approach as near to perfection as ever attained with this fruit, that, while accused of being the medium in the early fall of man is devoured by him at this day with an avidity that shows no rancor over the past. Apples from the Pecos are said to be eagerly sought in the markets of the East and London, and because the supply is not sufficient to meet the demand, the prices are always high. Many new orchards are being set out, the people about Roswell seeing permanent profit in the production of this fruit. More will be said concerning it later.

A Kentuckian, named John Chisum, was the pioneer of the Pecos Valley, establishing himself in the Pecos in the year 1878. Mr. Chisum was searching for a place in which to raise cattle on a large scale and he found the now celebrated South Springs, flowing eighty cubic feet per second of pure, cold water. These form the Southspring River, which empties into the Pecos six miles east. Chisum acquired 7,500 acres of land, including the springs, and being then 400 miles from a railroad, hauled in cereals, young fruit trees and machinery with ox teams. The planting done then by this Kentuckian is the horticultural romance of the Valley. He showed by his husbandry what might be expected of the soils when watered. He did not overlook beauty and comfort, either. Shade tree slips stuck into the ground by him are today stately trees that screen with interlacing branches miles of driveways along the ditches.

OLD APPLE ORCHARD BEARS HEAVILY

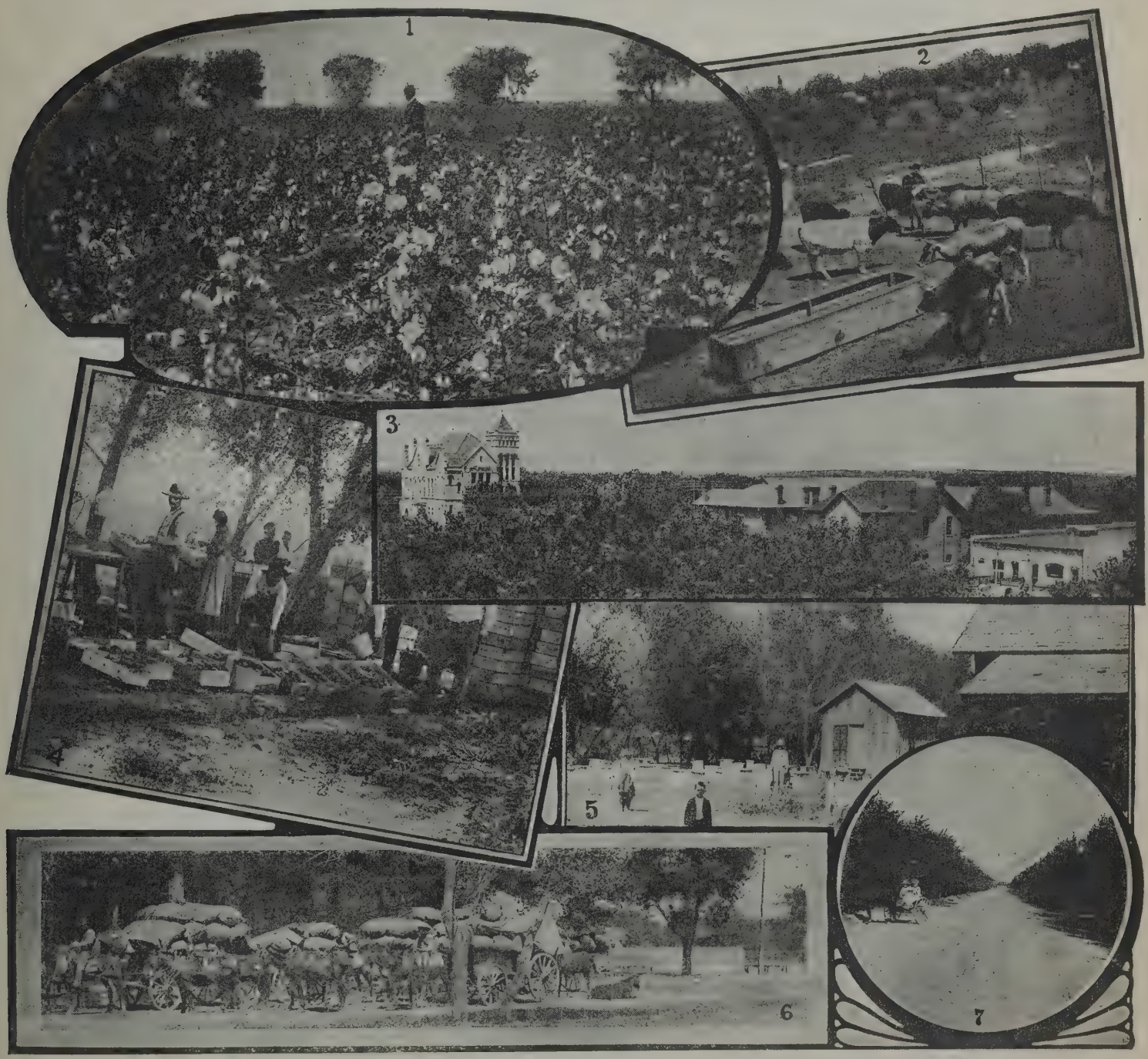
The five-acre apple orchard planted by Chisum twenty-eight years ago is today one of the show-things of the valley. Those old trees, pioneers of the horticultural history of the Pecos, are sturdy veterans, with spreading branches and thick trunks, vigorous and healthy, bearing each year a heavy burden of the finest fruit. In all the years they have never known a disease and their fruit has always been perfect. The apple industry in the valley has reached great proportions since these Chisum trees began to yield their treasures and

show the way. Results from all the orchards have been splendid. Noting the productiveness of the Chisum apple trees the present owner of the ranch decided that there was big money in growing apples and in the winter of 1894-5 he set out a large orchard—450 acres. This orchard has been giving money returns for years and from it there have been sent to the markets of America and some of those in Europe thousands of bushels of as fine apples as any man ever ate. This orchard is now in what in other regions would be the zenith of productiveness, although the trees have not yet reached their full size or bearing capacity and the crops they produce are beyond those of fully matured trees in many other apple producing parts of the country.

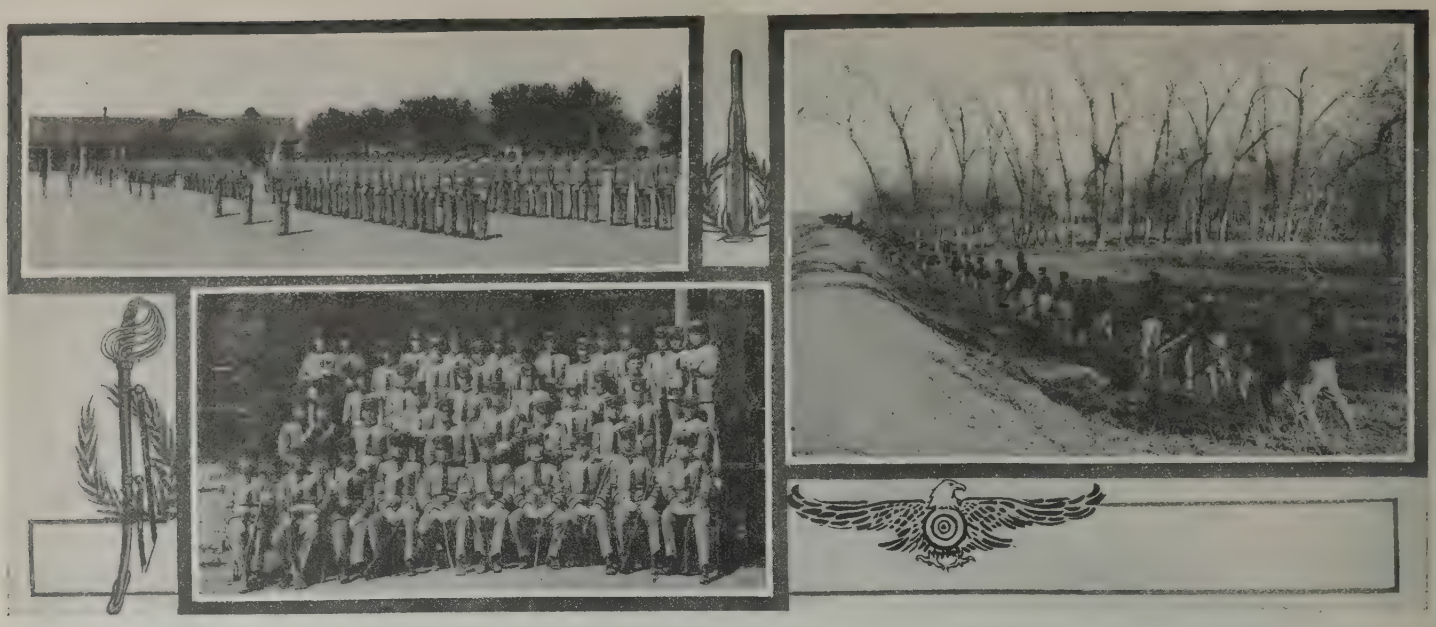
The growing season is nine months in the year in the Pecos and apple trees come into bearing much earlier than in the North. The trees usually bloom early in April and the harvest of fall apples generally begins about the middle of August. Jonathans and some other varieties are then ripe and sell at high prices, as they reach the market earlier than those of less favored regions. The harvest of winter varieties ends about November 1. Owing to their vigorous growth and freedom from fungus diseases, the apples of the Pecos keep as well as any grown in the North.

The "Hagerman Apples" are known from London to Texas. They have taken the highest honors at the great expositions. It is not claimed that Pecos Valley soil, water and sunshine will, without the aid of man's work, grow these apples. The natural conditions are there, but there must be work and intelligence applied to bring the fruitage. All methods must be skilfully applied, but the man who does not know anything of apple growing can easily learn how to produce them. There is always instruction and guidance if he will seek them. His own brains and application must do the rest.

As man is stronger here in the favored Pecos Valley, so is a fruit tree. For that reason an intermission in crops is far less frequent here than in the colder North, where man and tree are both taxed by the rigors of climate. "One year on and one year off" is by no means as common in the Roswell region as in the North. Because of the long growing season and for other reasons that time will make known, the trees recover their strength after one crop and



1. Cotton Produces a Bale to the Acre on Raw Land Under Irrigation at Carlsbad, N. M. 2. Farm Scene Near Carlsbad, N. M. 3. "Carlsbad, the Beautiful," from Roof of United States Government Building, Showing Court House and Schlitz Hotel of Fifty Rooms. 4. A Carlsbad, N. M., Peach Packing Shed, Rio Pecos Orchard. 5. Bee Keeping Pays Near Carlsbad, N. M. 6. Wool From Over 1,500 Square Miles of Free Range Comes to Carlsbad to be Stored and Shipped. 7. A Driveway Near Carlsbad.



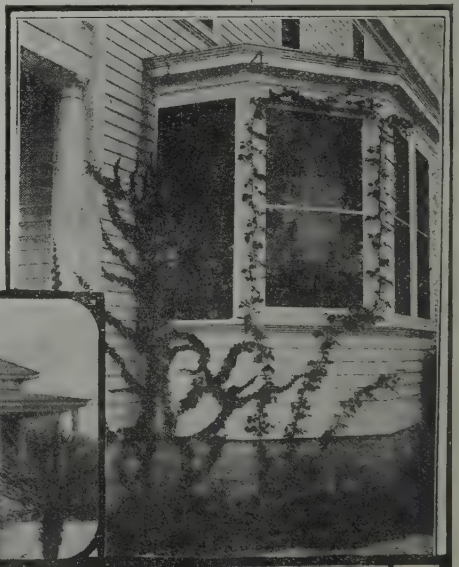
are ready for another the next year. Their rests are few. There is in the Chisum ranch orchard a block of 1,500 Missouri Pippin trees that had a full crop the fourth year after planting and have since borne four consecutive heavy crops of perfect apples.

APPLES SHIPPED TO DISTANT POINTS

The Pecos Valley apples, though many are shipped to New York and London, are sold principally in Texas and New Orleans, in one-bushel boxes and in barrels. The rate of freight from the valley to the markets is reasonable and the service good. Icing is not necessary, excepting early in the season. One thing that gives the Pecos Valley apples great advantage in the market as sellers is their bright red color. This color is produced by the cool nights and the sunshine almost every day in the fall.

Here are some of the figures that you want, now that you have been told by the Commercial Club what a beautiful and productive place the Valley of the Pecos is: You obtain forty acres of raw land, with a perpetual water right. It will cost you, say $50 an acre. You don't have to wait long if you go right to work, to begin getting your money back and making profit. Alfalfa planted in September can be cut from three to four times the first summer, and will yield at each cutting from three-quarters of a ton to one ton an acre. This hay will bring an average of $10 a ton, or $30 an acre the first year. Next year the cuttings will be from five to six tons an acre, making a return of $50 or $60. Alfalfa can be cut, cured and stacked at $1.50 per ton. This leaves a net profit to the Pecos Valley grower of from $42 to $50 an acre the second year. Land with a good stand of alfalfa sells readily now for from $100 to $250 an acre. An additional income can be obtained by pasturing livestock on the alfalfa fields for four or five months in the winter. These statements are all conservative and in no way exaggerated, the Roswell Commercial Club says, and it will gladly refer prospective settlers to farmers who have already made their homes there.

Forty acres are as much as one family can successfully cultivate in this valley and it is enough to bring ease to a very large family, so productive is the land and so certain the crops. The advice is to plant twenty acres in alfalfa, ten acres in apples and pears and the remainder in celery, vegetables and garden truck. Here are the returns as estimated: Alfalfa, 110 tons worth $1,100; apples and pears, when bearing, for from $2,000 to $3,000 on the trees, while the celery and garden truck will give a net income of $2,000 more. Celery is proving one of the great sources of quick wealth in the valley. A quality that cannot be surpassed in the world can be grown in this soil, it has been discovered, and the farmers have seized the opportunity without delay. This crop at the present time is declared



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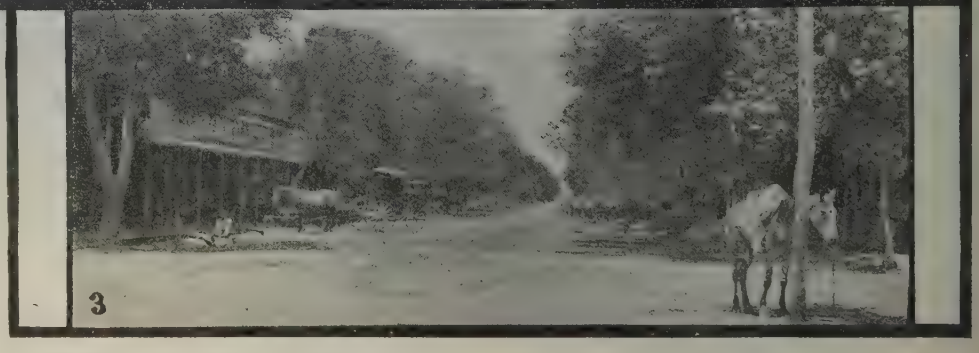

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1. Residence of Green Ussery. 2. Residence of Prosperous Citizen, Carlsbad, N. M. 3. Canyon Street, Carlsbad, Looking North. 4. Ampeopsis Veitchii, Planted February, 1905, and Climbing Kaiserin Augusta, Planted March, 1905. Top of Window Sash is 12 Feet From Ground. Residence of McQueen Gray, Carlsbad.

to be netting some of the farmers $400 an acre, the gross returns being $600. The fine quality of the product creates a demand beyond the supply and it does not look as if the industry could be overdone. The settler in the Pecos Valley has no fear of drought or too much rain. There can never be a crop failure. There is nothing in any season to prevent luxuriant growth and nothing to destroy it.

THE CARLSBAD PROJECT

The Carlsbad project possesses the best climate in the Arid West which means the best on earth.

The Carlsbad project is capable of the greatest diversity of crops and fruits because of a happy combination of both cotton and wheat, peaches and winter apples, alfalfa, and all kinds of live stock, free from disease. No worm or insect on fruit. No boll weevil. No hog cholera. No foot rot.

Under the Carlsbad project are produced the very best peaches in the world, commanding the highest prices, and put upon the market at the best time of the year, after Southern crops are over and before Northern crops begin, while its apples, pears, plums, quinces, cherries and grapes are equal to the best.

Under the Carlsbad project every acre carries with it one share of stock in the Pecos Water Users' Association, which entitles it to its prorata interest in a water supply approved and backed by its expert engineers, sold at actual cost and steadily increasing in value.

Under the Carlsbad project the soil has been examined, classified and approved by the engineers of the bureau of soils of the United States Government.

Under the Carlsbad project all titles to watered land have been passed upon by the attorney for the Water Users' Association subject to approval of attorneys representing the United States.

The Carlsbad project is named from valuable medicinal springs, destined some day to attract wide attention, which are now free for the use of all and may be just what you or some member of your family requires.

The Carlsbad project possesses the peculiar characteristics that its most natural products are high-priced—fruits, melons, celery, asparagus, onions, tomatoes.

Under the Carlsbad project an acre of peach trees, properly selected and cared for in full bearing, will yield from $500 to $1,000 gross in one year. An orchard of ten acres will average $300 per acre net throughout its bearing years. There has been one failure in fifteen years. It is not how much, but how well that counts in fruit growing and farming as in all pursuits in life.

The beautiful City of Carlsbad lies in the midst of the great area irrigated under this project. It has been most appropriately named "Carlsbad the Beautiful," and it is not difficult for the "stranger within the gates" to endorse the expression, because there are many features of the town which certainly give rise to it. The streets are wide and well kept and the sidewalks skirting them are broader than those usually provided in other territorial towns. In many places the crosswalks are paved with cement in the same manner as the sidewalks themselves and there is a general architectural finish to the residence which taken in conjunction with the ample proportions of the business houses and the broad porches of the hotels in the center of the town lend more the impression of a resort than of a commercial center. To cap it all the County of Eddy has erected here the handsomest court house in New Mexico, surrounded with a well irrigated park, a contribution to the general finish of the city by no means to be underrated.

IRRIGATION ITS LIFE

Carlsbad is the creature to a great extent of irrigation. It lies on the west bank of the Pecos River now dammed at four different points within twenty-five miles to the north and south of the city. Three of these dams are north of Carlsbad and two of them are

1. View of Pecos River, Carlsbad, N. M. 2. Largest Concrete Aqueduct in the World Across Pecos River. Carlsbad Project. Over 500 Feet Long, 48 Feet High. Arches 100 by 25 Feet in the Clear. 3. Bass Pool, Black River South of Carlsbad, N. M. 4. One of the Public Utilities Company's Power Dams at Carlsbad, N. M. 5. Shady Drive Near Carlsbad.

1. Country Home Near Carlsbad. 2. Residence W. P. Mudgett, Near Carlsbad. 3. Residence of William Beverly, Carlsbad. 4. Residence of W. H. Merchant, Carlsbad. 5. Residence of Francis G. Tracy, Carlsbad. 6. Eddy County Free Hospital at Carlsbad, N. M.

under control of the U. S. Government. The latter are the important links in the first completed government irrigation project in the United States and together they present one of the most interesting studies in New Mexico. The work was originally undertaken by private capitalists for whom it proved too great a task, the entire project meeting with disaster in the floods of 1904 which swept away the dam at the intake of the main canal and carried with it the hopes of the people who had established themselves along the twenty miles of irrigated country to the south. The history of the various and persistent efforts of the Carlsbad people to bring this great reclamation scheme to permanent success would make interesting reading but space preventing we must content ourselves with the statement that the whole matter has passed under federal control and with the completion of the Avalon diversion dam seven miles north of the city, it is once more ready for use and the curtain has been drawn forever on the period of speculation and uncertainty. Between 20,000 and 40,000 acres will eventually be reclaimed through the project and much of this ground is on the market as a result of the requirement of the Interior Department to the effect that no one individual may have water upon more than 160 acres, in addition to which he must personally reside on the land. In the early days the ground was held in larger tracts and often for speculative purposes, but the above stipulation has put an end to this and it is easy to foresee that the forcing of the land upon the market will result in a rapid increase in population and importance, for the city and environs. The fact also that the productive quality of the valley soil at this point has never been questioned adds to the assurance with which prospective homeseekers may approach the subject of purchase and furnishes the final basis for the prophesy of the largely increased land values.

POWER FOR MANUFACTURING

One of the thoughts which presents itself to the observer visiting for the first time the great dams at McMillan and Avalon is that much of the immense power which is now going to waste there must some day find an outlet in manufacturing and other enterprises. It is estimated that at certain periods of the year the dam at Avalon alone will develop from 4,000 to 6,000 horse-power, enough to railroad and light the entire irrigated district and in addition furnish the city with power for all purposes including that of manufacturing on a generous scale. At present the town itself is lighted from two dams, the Tansill, one-half mile to the north of the city, and from that of the Public Utilities Company, six miles to the south, the Tansill property being held under lease by that company. The two together furnish 300 horse-power and in addition to supplying the lighting system, the city water supply also under the company's control is pumped into a standpipe for general distribution throughout the town. The possibilities in this direction cannot be over-estimated and some day no doubt they will be fully availed of, whenever the settlement of the district shall have reached the point where the expense of installing the necessary plant appears to be justified.

FERTILITY OF THE SOIL

The soil about Carlsbad is generally a sandy loam underlain at a distance of from three to thirty feet with gravel or rock. Its quality of water retention has been demonstrated and it continues to maintain its original strength under intensive conditions. It also responds easily to cultivation and on that account is less costly to work than that of many other localities. From it is produced an unusual variety of farm and orchard products and the region vies with the entire valley in supplying the eastern and northern markets with the largest, best flavored and most perfectly colored fruit to be found in the United States. Corn and sorghum together with small grains of all descriptions are grown here with a minimum of labor and a maximum of yield and garden truck of all descriptions thrives throughout the entire district. Alfalfa reaches a fourth and fifth cutting and in addition there are 1,000 acres of cotton under cultivation in the neighborhood. There is also an increasing tendency among farmers toward the raising of poultry and bee culture both of which meet with success in the hands of those who understand the special problems presented. If the limitations of this article permitted, many interesting facts and figures might be given regarding the past performances of this region in the matter of soil production, but inasmuch as this is all recorded in the literature furnished by the Commercial Club of the town, the reader may, if further interested, send and get it for himself, or, what is better, take the train over the new cut-off and investigate on the ground.

The City of Carlsbad shares with all New Mexico in climatic conditions, which are unrivaled the world over. Its altitude is slightly in excess of 3,100 feet and it is so surrounded by hills that winds of winter and spring are screened to a great degree from the excesses elsewhere experienced. Three hundred days of sunshine during the year is the average record and the sufferer from lung and bronchial weakness finds here the relief for which he is seeking. Many of these already on the ground bear testimony to the magic effects of outdoor life in this region and are daily performing tasks for which they were totally unfitted in the localities from which they came. The conditions necessary to comfort and good living are also found in Carlsbad, which is well provided with water, electric light and telephone by the Public Utilities Company, controlled by Eastern capital. There are a number of fine hotels, prominent among which is the Schlitz, a $50,000 building, owned by and named after the Milwaukee brewer, and the Palace, an attractive structure on Main Street near the depot. The city owns a combination city hall and fire house and there is a fine public school building providing at present for more than 600 scholars of all grades from high school down. The Catholic Sisters also conduct a girls' school at Carlsbad and their building is one of the features of the town. There are five churches, all owning their own structures and representing the Methodist, Episcopal, Baptist, Presbyterian and Catholic denominations, and recently, through the efforts of the ladies of Carlsbad, a public reading room was established in the town. In addition both the Masonic and Odd Fel-

lows Lodges of Carlsbad have constructed their own headquarters near the center of the business section.

The life of the mercantile community at Carlsbad centers around its progressive Commercial Club, which now has a membership of nearly 100, including most all of the merchants and professional men of the city. Its business is to discuss and endorse, where necessary, matters pertaining to the welfare of the town and New Mexico at large, to aid in the establishment of new enterprises and the dissemination of literature calculated to bring new people into the district. It is particularly active this year and will no doubt demonstrate its usefulness by supervising the collection of a record-breaking exhibit for the Irrigation Congress to be held in Albuquerque this fall. The Club occupies handsome quarters which are frequently used for social as well as business purposes and for a town of 3,000 population, Carlsbad has every reason to be proud of the organization. In their efforts for the uplift and growth of the city, the people of Carlsbad are ably seconded by the presence of two live and aggressive newspapers, both of which are published weekly by men who have long been favorably known to the profession throughout the Territory. The "Carlsbad Current" is Democratic in politics and is edited by William H. Mullane, while the "Carlsbad Argus" represents Republican politics and is under the direction of W. T. Reed.

There are two live banking institutions in the city and about fifty mercantile establishments, most of which are housed in buildings of brick or stone construction and in which both wholesale and retail lines are represented. As a whole, the stores at Carlsbad are more attractive and much more extensive than at other points in the Pecos Valley, and the impression left upon the visitor is one of substantiality rather than of mushroom growth.

Taken all in all, Carlsbad with its wealth of foliage, its well kept lawns and gardens, its wide porched hotels, its great irrigation project and consequent opportunities for occupation and investment, together with its substantial citizenship, undoubtedly offers one of the most attractive points for the homeseeker in all New Mexico and on these accounts it has every reason to expect that it will eventually become the beneficiary of the unprecedented influx of population which is now finding its way into the land of sunshine and opportunity.

1. Watermelons Grow Without Care at Carlsbad. 2. 100 Acres of Kaffir Corn Grown Near Carlsbad. 3. Cutting Alfalfa on Farm of L. F. Deifendorf, Nearf Carlsbad. 4. Seedless Sultana Grapes. Vine Belonging to R. P. Love, Carlsbad. 5 and 6. Come to Carlsbad and Help Yourself to Peaches. 7. Apples Grow, Too, at Carlsbad.

An Old Garden Spot Reclaimed

By D. J. McCANNE

WHAT is known as the "Belen Cut-off" of the Santa Fe Railway, a connecting link 250 miles long through the middle of New Mexico, has been built to avoid the heavy grades over the mountains, and will be the main trans-continental route of that road. It has been under construction for two years and has opened to public notice and settlement much new territory. The most attractive place on the entire line is where it crosses the Pecos Valley, about 80 miles north of Roswell and 70 miles west of Texico. After traversing a prairie country very similar to the Panhandle country of Texas, for a distance of 70 miles from Texico, the traveler suddenly discovers a beautiful valley, with large groves of green trees and the Pecos River for a background, which looks like an oasis in a desert. Upon inquiry he is told that "Uncle Sam" selected this spot, before the days of the Civil War, for a military fort and a suitable place to teach the Navajo Indians how to farm; that it was occupied, for this purpose, by the soldiers from about 1860 to 1870 and designated as Fort Sumner Military Reservation; that several hundred acres of the land was irrigated, that several thousand Navajos were kept there and worked on the ditches and farms, that extensive buildings, avenues, orchards, and vineyards were established, and that all kinds of crops were grown for the sustenance of this large population.

The ruins of the buildings, the parade, orchard, and prison walls, as well as the remains of the ditches and laterals are to be seen. There is an avenue four miles long running through the valley, lined on either side with stately old cottonwood trees, many of which are now three feet in diameter. The stumps of apple, pear, and peach trees are still in evidence, and old settlers say that these trees lived and bore fruit up to ten years ago. One lone apricot tree still lives, with a trunk about a foot in diameter, as if in mute testimony to the vitality of the soil and climate.

After an unsuccessful effort to make farmers out of the Navajos and the soldiers being needed elsewhere, the Indians were allowed to return to their old life, and the post was abandoned. The reservation was thrown open for pre-emption and was taken up by individuals, and afterward acquired by some large cattle companies, and has since been used as a cattle and sheep range. It has for many years been the favorite lambing and shearing grounds of the sheepmen. It has been a trading post for a large section of country all these years, and is one of the historic outposts of civilization.

RECLAIMED BY IRRIGATION. When it became definitely known that the Santa Fe would build through here, a new canal was located and the waters of the Pecos filed upon, the first recorded filing on the Pecos in the County, and negotiations were commenced to buy the lands from its various owners. After about a year's work the irrigable portion of the land, with the exception of a small interest, was purchased by a development company, and a canal, 20 feet wide at its head and nine miles long, has been constructed to irrigate about 7,000 acres of irrigable land lying east of Pecos River. While the canal and diverting dam were not quite ready to give satisfactory results for the season of 1907, yet about 1,200 acres were bought by people who had faith in the final outcome, and about 200 acres were planted to orchards and as much more cultivated in other crops, and preparations are being made for a fine demonstration during the season of 1908.

SUPERIOR LOCATION. It is confidently believed, by those who ought to know, that this portion of the Pecos Valley is going to equal the most favored sections of the valley in the production of apples, pears and alfalfa, due to its freedom from alkali, its abundant water supply and the fertility of its soil. It has a red sandy loam of unusual depth underlaid with gravel, in which abundance of water can be had at depths of 15 to 30 feet. With the additional advantages here, of being located on a transcontinental line of railway, great results are foreseen for farmers in this valley. As an evidence of the faith in its future, some of the cattlemen, who have ridden over it for years, are selling out their cattle and buying land to make their fortunes raising apples and pears and enjoy an ideal home life. A prominent banker, who has been familiar with the whole Southwest country for years, says: "I verily believe eighty acres of land under the Fort Sumner canal, in the hands of a competent man, will be worth thousands of dollars within ten years." Another "old timer," who has watched the growth of favored spots, says: "Mark my words, this whole valley will be a city of orchard homes, like the Riverside Valley of California within a few years."

WATER SUPPLY. Some, who are familiar with the Pecos River lower down, express surprise when told that at Fort Sumner it is a bold stream barely fordable most of the season. About 30 miles south of here it sinks in the gravel and is largely lost to view. The United States Government has maintained a gauging station about three miles above the town of Fort Sumner for several years past, and on the assurance this has given of the water supply, has recommended for construction the Urton Lake Project by which 70,000 acres of land are to be irrigated, from an appropriation, which follows and is subject to the prior filings of the Fort Sumner Canal. Chief Engineer W. R. Reed of the Reclamation Service says: "The monthly discharge of the Pecos River near Fort Sumner was 6,000 acre feet for the lowest month of the year 1905." This was a year of low water and we asked for this information for that reason. This ought to satisfy any inquirer as to the water supply.

FINE CLIMATE. Those who are familiar with the climate of the Southwest need hardly be told about the climate of this valley. It is an ideal place for homes. Its climate, its healthfulness, its water is not surpassed even by Southern California. Its summers are tempered by its 4,000 feet altitude, so that while its maximum temperature may sometimes rise to 100, it is not oppressive, and its nights are always cool and refreshing. Its winters are tempered by its southern latitude, so that farm work is seldom retarded by frost. As an indication of its mild winters, oats planted the first week in January had grown three inches by February 7th. Alfalfa and fall grain will grow all winter and furnish fine winter pastures.

STOCK FARMING. It is very unusual to find a section suited to fruit growing and intensive farming, where stock growing may also be carried on with success. The country on the west side of the Pecos, is very suitable for grazing purposes. This has been the great sheep-growing section of New Mexico for many years. Three million pounds of wool are clipped in this section annually, and a large part of the lambs fed in Colorado are grown here. The farmer who grows his own alfalfa and grain, and at the same time raises his own lambs, and feeds them at home, has a great advantage, when he is as near the market as his competitor, who has to

pay a big price for his lambs. Hogs are very profitably raised on alfalfa in this valley. Corn grows well so that the feeder has all he needs to fatten his pork. Poultry and bees do well and can be made a source of big profit as a side line.

Market Gardening. There is a wide stretch of country trav-

Felix Dam, Pecos Valley, New Mexico

ersed by the lines of the Santa Fe between the gardening section of the middle states and the irrigated sections of the arid country, where such industry can be successfully carried on. There is one other irrigated valley on the line of the road, but it is 200 miles west, at Belen, and as yet it is giving but little attention to market gardening. The growing towns along this great thoroughfare will soon make a market for large crops of this kind, and this valley is where they will be grown. Bermuda onions, potatoes, melons, celery, cauliflower, tomatoes, beans and all the small fruits can be grown to perfection between the orchard trees, and return a big profit, while waiting for the fruit trees to come into bearing. A large canning factory would find this an excellent place for business.

Apples and Pears. The apple orchards of Roswell are yielding from $300 to $500 per acre, and pear orchards as high as $800 per acre. The demonstration made by the growth and fruitfulness of these fruits, under such adverse conditions as have prevailed on these reservation lands, since they have been left to the browsing of cattle, leave no doubt that these are the money makers for the farmers to raise in this valley.

Grapes are said to have flourished, and promise great profit here.

At the Gerhardt place, a few miles up the valley, all these fruits and garden crops are grown successfully. Pecan trees 18 inches in diameter are growing there and bearing nuts abundantly.

A Coming City. Fort Sumner is the name of the town that has been platted, covering 320 acres. In the northwest corner of this tract the Santa Fe has built a fine concrete depot, and there are three big concrete buildings being erected, beside some smaller buildings. While very little effort has yet been made to push the town, when the train service on the cut-off is started, there are good reasons for the belief that this will make one of the best towns on the new line. One of the attractive features that will make every passenger remember Fort Sumner is a proposed lake in the residence portion covering 26 acres surrounded with parks and drives. There seems to be a good opening here for an experienced town-site man, as well as a good colonization man.

Through Train Service. A passenger train is now running each way making close connections with the through trains east and west at Amarillo and at Albuquerque. Homeseekers may secure through rates to Fort Sumner, and by presenting their tickets get half rates to Roswell and other points down the valley. Those looking for a place where they may raise fruit and alfalfa, hogs and lambs, and enjoy an ideal home life, should visit Fort Sumner on the Pecos.

Cutting Oats in the Pecos Valley.

Mesilla Valley, Garden Spot of the Southwest

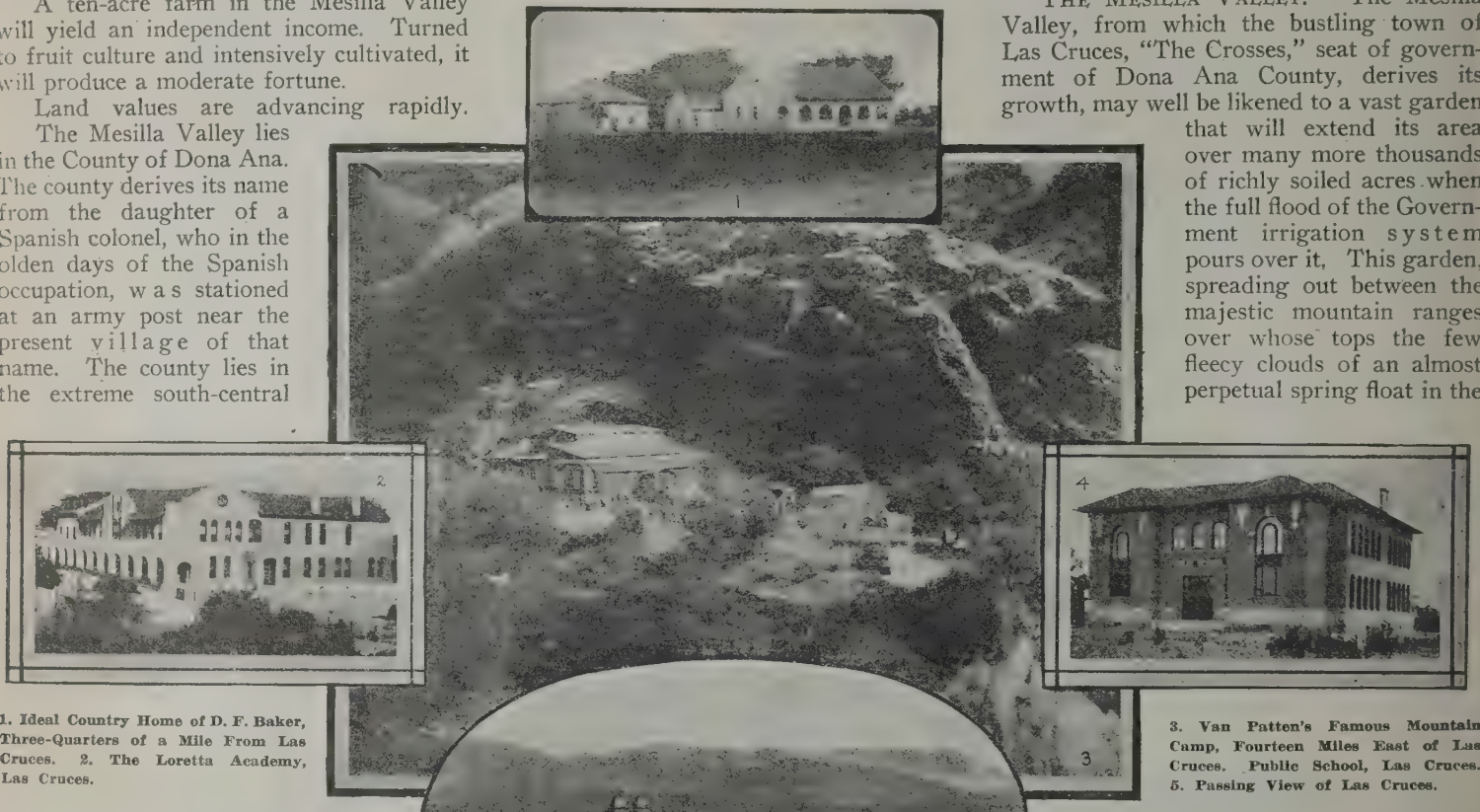
By R. E. McBRIDE

MODERN IRRIGATION in the Mesilla Valley is now being brought to its highest development. One hundred thousand acres of valley land will be reclaimed by the Elephant Butte National Irrigation Project. Forty thousand acres are now under cultivation, with permanent and assured water supply.

The soil of the Mesilla Valley is rich and deep. The climate is ideal for the pursuit of Agriculture and for health. With intelligent, energetic labor, a crop failure on irrigated land is impossible. The returns are generous and sure.

A ten-acre farm in the Mesilla Valley will yield an independent income. Turned to fruit culture and intensively cultivated, it will produce a moderate fortune.

Land values are advancing rapidly.



1. Ideal Country Home of D. F. Baker, Three-Quarters of a Mile From Las Cruces. 2. The Loretta Academy, Las Cruces. 3. Van Patten's Famous Mountain Camp, Fourteen Miles East of Las Cruces. Public School, Las Cruces. 5. Passing View of Las Cruces.

The Mesilla Valley lies in the County of Dona Ana. The county derives its name from the daughter of a Spanish colonel, who in the olden days of the Spanish occupation, was stationed at an army post near the present village of that name. The county lies in the extreme south-central section of New Mexico. On the south it is bounded by the Republic of Mexico and El Paso County, Texas. On the north lie Socorro and Sierra Counties; on the east, Otero County, and on the west, Luna and Sierra Counties.

The county has an area of 3,818 square miles, or 2,443,635 acres, its area being about twice that of the State of Delaware.

The Rio Grande enters the county in its northwest corner and, flowing in a southeasterly direction, divides the county into two almost equal parts, the land running back from the river in a broad expanse of fertile valley and rolling mountain ranges. All that portion of the Valley of the Rio Grande lying in Dona Ana County is known as the Mesilla Valley. In the northwestern section of the county are the Good Sight, Caballo and Magdalena mountain ranges, while the Organ and San Andreas Mountains pass through the eastern part, rising in a series of broken, majestic peaks, rich in minerals into which the pick of the prospector has as yet hardly been driven. The Organ Mountains, the principal range within the county, rise to a height of from eight to nine thousand feet and lend a background of rugged and magnificent scenery to the sheltered valley below.

Dona Ana was one of the original counties established upon the creation of New Mexico into a Territory of the United States and extended across the entire Territory from east to west. In 1855 all of the Gadsden Purchase was annexed to the county and remained a part of it until the organization of the Territory of Arizona, when the county's western boundary was reduced to that of the present western boundary of New Mexico. From Dona Ana County have been created in whole or in part the present counties of Grant, Luna, Otero, Eddy, Chaves, Roosevelt and Sierra. The old town of Mesilla and later Las Cruces as seat of government of Southern New Mexico have from the very organization of the Territory played an important part in its history. A writer in "Farm and Orchard" for November, 1907, thus describes the Mesilla Valley:

THE MESILLA VALLEY. "The Mesilla Valley, from which the bustling town of Las Cruces, "The Crosses," seat of government of Dona Ana County, derives its growth, may well be likened to a vast garden that will extend its area over many more thousands of richly soiled acres when the full flood of the Government irrigation system pours over it. This garden, spreading out between the majestic mountain ranges over whose tops the few fleecy clouds of an almost perpetual spring float in the sunshine like birds of soft plumage at play in the bowl of heaven, gives invitation to the people of the world to come and make homes of delight and plenty for themselves. The invitation is meeting with response. This is a spot toward which thousands of pleased eyes are turned, where thousands of new people will soon be residing." Rhetorical as it is, the writer's description of the valley is not at all misleading, nor is it overdrawn.

The Mesilla Valley, the name given to that section of the Rio Grande Valley in Dona Ana County from Rincon on the north to the Texas line on the south, is one of those favored sections "high enough to escape humidity and far enough south to protect it from severe cold". Practically all of the land in New Mexico to be irrigated by the Elephant Butte Project lies in this valley. The land, particularly that in the river bottoms, is very fertile. This does not mean that the land will produce fabulous crops without labor. No claim of the miraculous is made for this valley. Here, as elsewhere, the soil will not yield its best returns without hard work, and proper cultivation. The claim is made, however, that with proper cultivation, this land will produce results equal, if not superior, to those to be had from the richest irrigated districts in the world.

The soil is, for the most part, a mixture of sand and adobe (clay, or clayey soil that is very sticky when wet and that bakes very hard when dry). Between the clay on one hand and the coarse sand on

the other are to be found every gradation of clay-loam, loam and sandy loam. Generally the soil is easy of cultivation.

That section of the Mesilla Valley north of the town of Rincon, is known as the Rincon Valley, conditions there being substantially the same as in the lower valley. The altitude of the Mesilla Valley is about 3,800 feet while north of Rincon it rises to about 4,000 feet.

Quoting again from the writer in "Farm and Orchard": "Farming in the Mesilla Valley has no element of speculation about it. The only thing that taxes the genius of the grower is to choose those products that will bring the largest returns. With the necessary labor applied all crops will bring profit. The soil will respond with gratifying liberality to the hand of the energetic tiller. The returns are enormous in comparison with the amount of capital and labor expended."

There is no difficulty in finding a market for every pound of produce grown in the valley and transportation facilities are ample.

The description of the valley may be easily followed upon the accompanying map of the Elephant Butte Project and its adjacent territory.

Las Cruces. Las Cruces, the City of Crosses, is the county seat and principal town of Dona Ana County. It was laid out in 1848, at the close of the Mexican War, by United States army officers from the military post at Fort Selden, 18 miles to the north. The town is beautifully situated on the eastern edge of the Mesilla Valley at an altitude of 3,875 feet. Until comparatively recent years Las Cruces was one of the picturesque "show places of the Southwest". But the magic wave of development that has swept over all New Mexico within the past five years, has found Las Cruces and has transformed it from a one time sleepy "adobe" town into a rapidly growing, hustling little city of the most progressive type. It is forty- three miles north of El Paso, Texas, and 210 miles south of Albuquerque, on the main line of the Atchison, Topeka and Santa Fe Railroad from Albuquerque to El Paso.

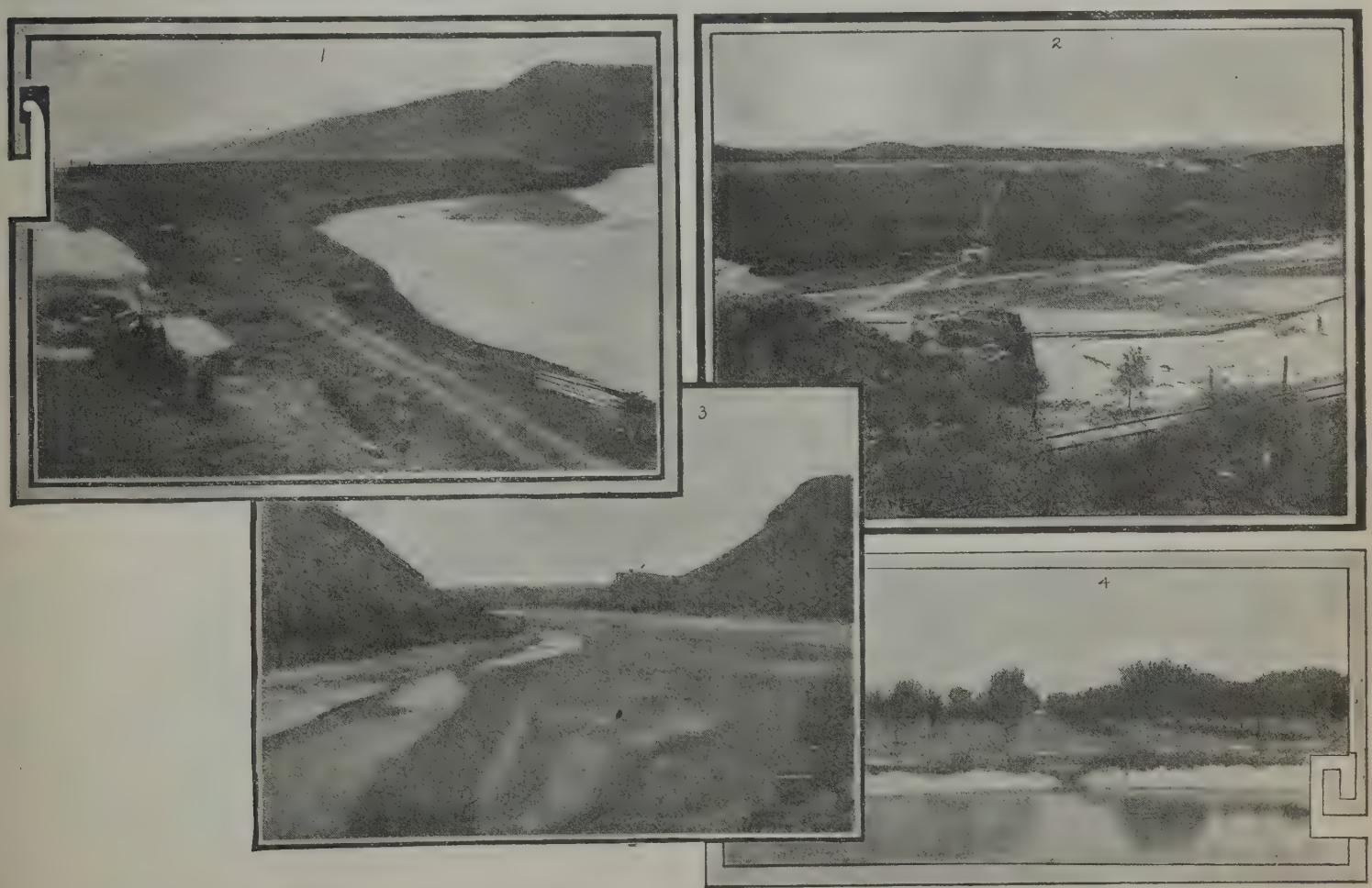
Incorporated in 1907, Las Cruces now has municipal water works, electric power and light plant, ice factory and cold storage plant, two flour mills, a fruit and vegetable cannery, a steam laundry and all of the conveniences of the typical, hustling Southwestern city. The population is now about 4,000. Should the present rate of increase continue it will have considerably passed the 5,000 mark before the census of 1910. There are two excellent hotels and a number of first class rooming houses, two strong banks, a handsome Roman Catholic cathedral and several buildings owned by the Protestant denominations.

Las Cruces is very justly proud of the educational facilities the town affords. The public school system is excellent. Three buildings are used, the North Ward, the South Ward and the Central building. This latter, completed during 1907, contains eight class rooms, an office and library, is heated by steam, lighted by electricity and equipped with city water and all conveniences. The grounds are ample to allow an addition the same size as the present building and this will be found necessary within the next two years, as the present enrollment of between five and six hundred taxes the capacity of the present buildings. The schools are under direction of a superintendent and a corps of thirteen teachers. They are thoroughly graded, carefully directed and only the most competent teachers are employed. The length of the school term is nine months. These schools compare favorably with those of any town of equal size in any section of the United States.

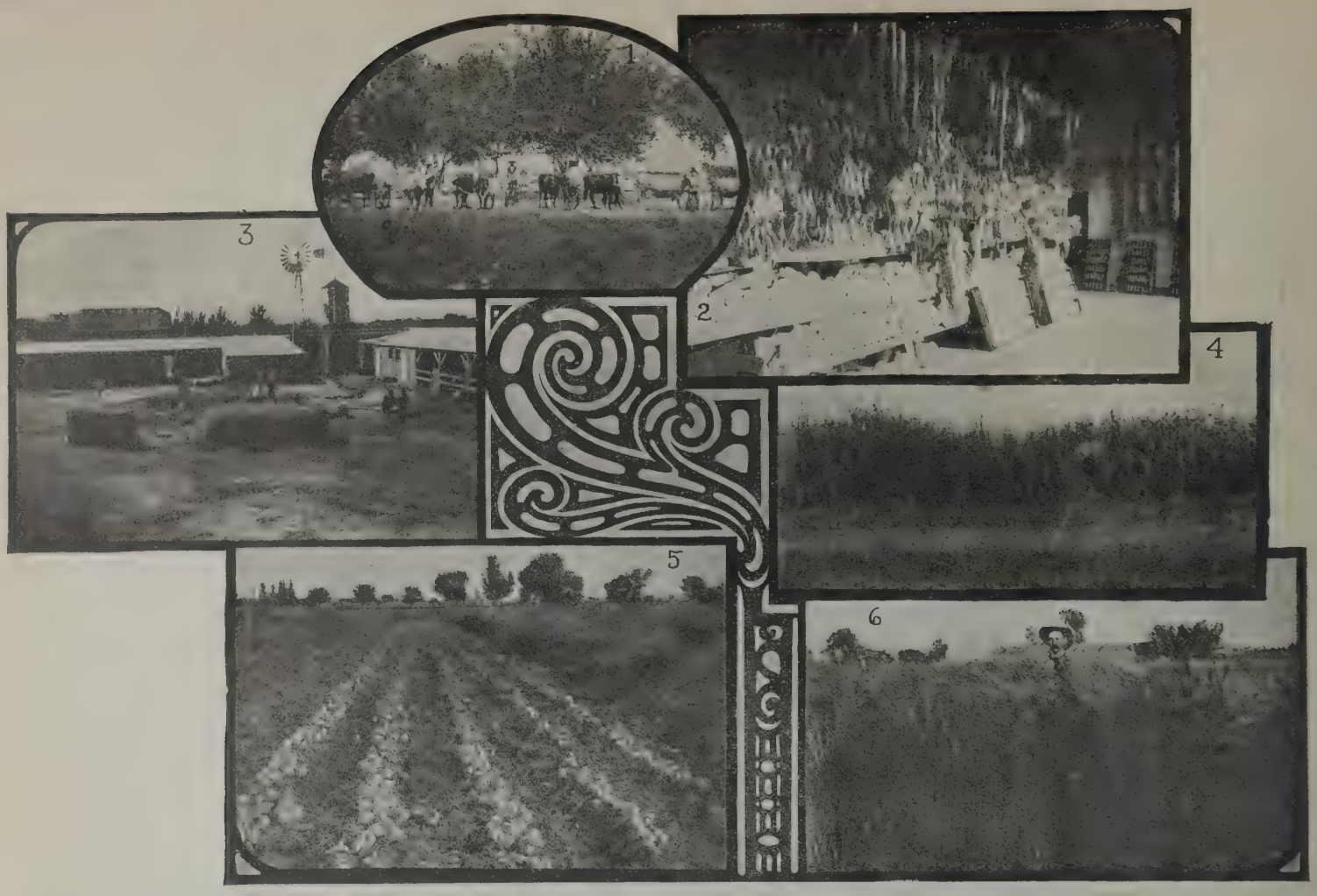
Graduates from the common branches of the Las Cruces public schools are granted entrance wtihout examination to the courses of the Agricultural College without examination. This institution, located two miles from Las Cruces, will receive special attention in the following pages.

The Sisters of Loretto maintain a large convent and a thoroughly equipped academy accommodating 150 pupils, the enrollment being always full. This institution, which has recently been enlarged and improved, is one of the best equipped schools of its kind in the Southwest. It is under direction of Sister Abertina who has the assistance of twenty Sisters.

Other Settlements. Mesilla, the second largest town in the



1. Excavation and Construction of Leasburg Canal, Looking Down the North Side of the River from Penasco Rock. 2. Leasburg Diversion Dam Site, Rio Grande Project. 3. Rio Grande Project Dam Site, Looking Up the River. 4. Residence and orchard of Mr. Barker, Rio Grande Project.



1. A Mesilla Valley Herd at the Agricultural College, Mesilla Valley. 2. Exhibit of Wheat and Other Products Grown at the Agricultural Experiment Station in the Mesilla Valley. 3. Baling Alfalfa, Agricultural Corral, Mesilla Valley. 4. Corn Grown Under Irrigation in the Mesilla Valley. 5. Experimental Tests of Onions in Mesilla Valley. Macaroni Wheat Grown Under Irrigation in the Mesilla Valley.

county, was the county seat, as well as the seat of the court and United States land office until 1880. The town is one of the oldest in New Mexico and in the stirring early days was the scene of many history-making events. Save for a magnificent new brick cathedral recently built by the Catholic parish, it is an "adobe" town, picturesque, but not yet awakened to the new life that has found its more energetic neighbor.

Mesilla Park, two miles south of Las Cruces, on the Santa Fe Railroad, is a suburb of Las Cruces and is chiefly important as the station for the Agricultural College.

Anthony and Berino are small towns on the Santa Fe Railroad in the southern part of the county and on the east side of the Rio Grande. They are shipping points for prosperous farming districts and a large flour mill is located at Anthony.

San Miguel, La Mesa and Chamberino are small settlements on the west side of the river, in the midst of a rich farming district just beginning to go forward. Around each of these villages large tracts of most favorably located land are awaiting to be put under cultivation. At Chamberino, General B. J. Viljoen, late lieutenant general of the Boer forces in South Africa, has located a colony of his energetic people who are materially aiding in the development of that section. Until recently the west side of the Rio Grande has been without communication with the railroad save by fording the treacherous river. There is now, however, a substantial bridge near San Miguel, while another, further south, will soon be built.

Dona Ana, five miles north of Las Cruces, is one of the old adobe towns.

In the northern part of the county are the towns of Rincon, Colorado and Garfield. Rincon is an important junction point on the Santa Fe Railroad and with the completion of the Elephant Butte Project will become an important shipping point for the northern part of the valley.

Irrigation in the Mesilla Valley. When Coronado, most daring and most successful of the Spanish Conquistadores, marched north from Sonora into what is now New Mexico in search of the fabled seven cities of Cibolla, stories of whose untold wealth of gold had captured his fancy, he found the Indians along the Rio Grande diverting the waters of the river through crude ditches to irrigate their lands. The story of Coronado's wonderful march and its discoveries is not for this brief bulletin, but we know beyond question that irrigation as found by him was practiced in the Rio Grande valley long before Columbus discovered America, while there is ample basis for the theory of many writers and scientists that irrigation along the Rio Grande antedated irrigation in the Valley of the Nile. The Rio Grande Valley, therefore, has full justification in claiming title as the cradle of irrigation in America; and there is a splendid justice in the selection of a portion of this valley as the site for the greatest irrigation project ever undertaken by individual or government, the Elephant Butte, or Engle Storage Reservoir Project.

To the man who is interested in irrigation there is an intense fascination in the story of the development of irrigation in the Rio Grande Valley, from the first crude ditches of the Pueblo, or village Indians, through the early struggles of the pioneers with their community ditches, up to the great Elephant Butte Reservoir and its broad canals, representing the highest development of the modern science of irrigation.

As nearly as can be learned from the early Spanish records prior to and immediately succeeding the great Indian uprising of 1860 when all Spaniards were driven from the country, the agricultural population living along the Rio Grande and cultivating their land by irrigation consisted of the Tiguax, Pecos, Taos, Picuries, Queres and other Pueblo tribes. The village Indians were the constant prey of the roving Apaches and their farming was only that necessary to furnish the bare necessities of life. It is impossible to arrive at any accurate estimate of the amount of land cultivated along the Rio Grande prior to 1800.

The Spanish priests and officials established missions and settlements, generally at the points where they found Indian settlements, adopting the methods of the Indians in cultivating the soil and raising not a few of the same crops which are today being profitably grown under modern methods on the same soil. This desultory form of farming continued from 1598 to the time of the American occupation. It is from the American Occupation in 1846 that modern irrigation in New Mexico dates. In this year General Stephen W. Kearney took possession of the Territory. The records of the Kearney campaign furnish abundant evidence, were evidence needed, of the extent of cultivation of the soil by the natives along the river valleys.

There is no record of the flow of water in the Rio Grande prior to 1880. From that time the supply, particularly in the lower valley, has been uncertain, chiefly because of inadequate ditch and diversion systems. But the government reclamation service has begun work on the Elephant Butte Project; the first unit in this great project, the Leasburg Diversion Dam, has been completed and the days of water famine and uncertain supply for irrigation in the Mesilla Valley are gone forever. That there should have been water famines in the past is not surprising when it is recalled that the ditches used were in many cases those used by the Indian three centuries before.

THE RIO GRANDE SYSTEM. The Rio Grande occupies first place in number of irrigators, acreage and length of canals in use. Rising in Colorado it flows through the entire length of New Mexico. Upon its entrance into the Territory it passes through a series of long, deep canyons to emerge near Embudo, just north of Santa Fe. Thereafter it possesses the characteristics of a typical desert stream,—"too thin for successful cultivation, too thick for a constant beverage and reasonably deep if turned on edge." It is not to be assumed from this oft-quoted sentence that the Rio Grande carries little water. No greater error could be made. The volume of its flood is enormous, while its constant flow is large, although chiefly in the gravels beneath its bed.

Today there are more than 100,000 acres irrigated from the Rio Grande in New Mexico, the water from which is led through more than 1,000 miles of canals built at a cost of considerably more than $1,000,000.00. A very large portion of this acreage is in the Mesilla Valley, although large areas are in cultivation near Albuquerque and at intervals from there through the entire length of the valley to El Paso, Texas.

Two of the most surprising things noted by the newcomer in the Rio Grande Valley are the wonderful opportunity for the utilization of its water supply and the limited extent to which this opportunity has been taken advantage of. Two principal influences have operated to hold back irrigation along the Rio Grande, particularly in the Mesilla Valley. The first was an ancient and doubtless honorable treaty with Mexico by the terms of which the storing of flood water was prohibited for the ridiculous reason that such storage interfered with navigation. The only navigation on the Rio Grande is about 1,000 miles south of the southern boundary of New Mexico. This treaty has at last been abrogated, "for which relief much

1. The Agricultural College Buildings, Mesilla Valley. 2. A Drive Through the Agricultural College Farm. 3. Chrysanthemums Grown in the Mesilla Valley. 4. Sample Cantaloupes Grown Under Irrigation in the Mesilla Valley. 5. Grapes Grown by Irrigation at the Agricultural College. 6. Cannas Grown in the Mesilla Valley. 7. View Across the Mesilla Valley. 8. A Young Orchard under Irrigation.

thanks." The second cause for retarded development was the unsettled condition of title to most of the lands which could be irrigated; and this latter reason has also happily passed away. The control of the river and its use for the beneficial purpose of irrigation is now assured and on it are to be built several of the greatest of the government projects.

THE MESILLA VALLEY IRRIGATION SYSTEM. The present Mesilla Valley irrigation system consists of all the ditches along the Rio Grande from Rincon to El Paso, eight in number, known as community ditches, or canals maintained in common by the communities of farms served with water therefrom. These ditches all take their water from the Rio Grande and head from above Rincon on both sides of the river, carrying the water in a southerly direction. They are 75 miles long with an average width of 13 feet and an average fall of two feet per mile.

These ditches were first constructed in 1848, in the strenuous days when the workman held the spade in one hand and a musket in the other, enduring all sorts of privations and dangers for the sake of obtaining water for the land. The initial cost of construction of this ditch system was $43,725. The flow of water has not been measured up to within the past year, but the average is about 128 feet a second, although the estimates run as high as 1,000 feet a second. The water is given to the users proportionately, the system used being substantially that of the 16th century. The annual assessment has been about seventy-five cents an acre, but the amount varies according to the work necessary to keep the ditches in serviceable condition. There has been a scarcity of water in late years, due to engineering difficulties in the operation of diverting the water from the river, and as a result crops have been below the average. Through the completion in 1908 of the Leasburg diversion dam, fully described further on, these difficulties have been disposed of forever and the days of short crops, due to scarcity of water, are over.

North of Rincon, in Dona Ana County, is another community ditch, known as the Acequia de Colorado. This also takes its water from the Rio Grande, was first used in 1875 and cost $7,500 to build. It is 12 miles long and conditions theron are quite similar to those in the lower valley.

THE ELEPHANT BUTTE RECLAMATION PROJECT. All of the many miles of community ditches, working on a system dating from the days of Coronado, are to be retired by the magnificent, modern system of canals to be supplied from the mighty Elephant Butte Storage Reservoir.

The terms of the National Reclacation Act, signed by President Roosevelt, June 17, 1902, are now well known to all who are interested in irrigation. "This law places at the disposal of the Secretary of the Interior the proceeds of the sale of public lands in the thirteen arid States and Territories, to be used in the construction of irrigation works."

The Elephant Butte Dam and Reservoir, known also as the Engle Dam and the Rio Grande Project, is the largest of the twenty-five projects thus far approved and ordered to be constructed by the officers of the National Reclamation Service. The following description of the Elephant Butte Project is from an article which appeared in the "Earth" for September, 1907, with the approval and authority of the officers of the Reclamation Service:

HISTORY OF THE PROJECT. The Rio Grande Project in New Mexico is one of the largest and most expensive of the several great engineering works which the Government is now engaged in building. Aside from the stupendous engineering works involved in this project, a peculiar interest attaches to it by reason of the region in which it is located. Successful farming by irrigation was practiced here centuries before the Puritan Fathers landed on the bleak and inhospitable shores of New England. Primitive as were these methods of agriculture they sufficed to sustain a large population in peace and contentment. Strangely, too, their communal system of farming, with homes in the pueblos and small, cultivated areas nearby, is essentially now being adopted by our later civilization as best adapted to desert conditions. During the last twenty years conditions in the Valley of the Rio Grande in Southern New Mexico and Texas have been growing acute. Numerous diversions of the stream in the upper reaches in New Mexico and Colorado gradually deprived the old canals below of their supply. Colorado took from New Mexico, New Mexico from Texas and Texas in turn robbed Mexico. The fight became interstate and international and it grew intense in years when the river was low. The comity of nations was threatened more than once, while the feeling between citizens of New Mexico and Texas was at fever heat.

A treaty was made with Mexico which prevented further diversions of the Rio Grande in Colorado and which recognized Mexico's prior rights and the justice of her claim for damages to property of her citizens. For fifteen years we have ignored those claims, every attempt to secure Congressional action having failed.

One day a long-legged engineer of the Government, a man with an inquisitive mind, entered the valley and wandered up the river. He studied the records of the stream flow, examined old plans for irrigation works, but he didn't like them. As one Texan said, "He wasn't suited by a Dam site." It was really all a matter of a dam site, and when he found what he wanted, as he finally did, he went back to Washington and reported.

Surveyors were sent into the valley. Diamond drills punched holes in the river bed, and canals were projected. Then a board of engineers went over the plans, approved them and sent them to Washington, where they were accepted. The problem was only partly solved, however, for here was a valley divided against itself with citizens short on temper and quick on the trigger, and a dozen other plans to dispose of .

An engineer who combines the qualities of an Ericson and a Richelieu was dispatched to present the Government's new plan. His patience, tact and perseverance were rewarded. A great mass meeting was held in El Paso and Mexico, Texas and New Mexico enthusiastically ratified a pact of peace and pledged support of the Government plans.

The proposition of the Government engineers was this: The United States agrees to construct irrigation works which will furnish an adequate supply of water for 180,000 acres of land in New Mexico and Texas, and to permit enough water to flow down the river to irrigate the lands in Mexico, which had been deprived of their water supply.

The landowners in New Mexico and Texas, whose property is to be benefited, agreed to mortgage their lands as se-

Valley Ranch Houses

The Picturesque Organ Mountains—The Magnificent Background of the Mesilla Valley

curity for the repayment of the cost of the work, and Mexico promised to cancel her claims for damages in return for the water delivered her. Today Texas and New Mexico citizens are working as one man for the success of the project. It will succeed, for there is no richer, finer land out of doors than this same valley from El Paso, Texas, to Engle, New Mexico.

The most striking feature about the Rio Grande Project is the Engle Dam. It is difficult to describe this ponderous structure of masonry which will rise 255 feet from foundation to parapet and will be 1,150 feet long on top. If you can imagine a structure nearly as high as the Flatiron building and more than three city blocks long, you will appreciate the massiveness of this dam. It will wedge the lower end of a canyon 40 miles long, and it will check and hold the biggest flood ever known in the Rio Grande. The capacity of this storage work makes the Croton Reservoir look like a mill pond. It will make a great lake, forty miles long, more than a hundred feet deep and containing sufficient water to cover 2,000,000 acres one foot deep. Even the great Assouan Dam of Egypt stores only half as much.

The Engle Dam, with its great gates, its sluicing tunnels and capacious spillways, will cost $5,300,000. Its stored waters will be led in broad canals to irrigate 180,000 acres of land or twice the acreage now supplied by the entire stream in this country. The cost of the entire work is estimated at $7,200,000, or an average of $40 for each acre irrigated.

Under the terms of the Reclamation law the irrigated lands must be sub-divided into farms of not more than 160 acres each, to be occupied by an actual resident who must cultivate the land. Every dollar expended must be returned to the Government by the land owners in ten years after completion, but without interest.

Unafraid of what in other sections would seem an impossible tax, the farmers of the Rio Grande Valley had no hesitation in mortgaging their lands to the Government as security for repayment of the cost of the works.

Land without water in the valley is valueless while irrigated land sells readily for from $100 to $600 per acre. The principal market for the farm products of the valley is El Paso and the irrigated lands are traversed by two transcontinental lines of railway.

The Leasburg Diversion Dam. At best it will require four or five years to complete the stupendous work of building the Engle Dam and owing to the limited condition of the Reclamation fund at the time the project was approved, it was not possible to commence construction on the main project at once; but $200,000 was set aside for construction of the Leasburg Diversion Dam and the enlargement of the main Las Cruces canal, a unit of the main project. Work was begun on this diversion dam in November, 1906, and water was turned into the ditches with appropriate ceremonies on Wednesday, February 12, 1908, in the presence of several hundred enthusiastic citizens of the valley, who saw in the turning on of the water the passing of years of worry over short water supply for irrigation: For with the completion of this dam all possibility of a water famine in the canals now in use is impossible, so long as there is water in the river. This diversion dam is no small structure. It is of concrete, six hundred feet long, connected with the old Las Cruces ditch system by a canal six miles long and supplies water to 40,000 acres. It is strictly a diversion dam, however, and stores no water for use when the river is low.

Theory and Dimensions of the Engle Dam and Reservoir. The diversion dam sinks into insignificance as a mere temporary expedient when compared with the greater project. The Engle Reservoir will be forty miles long and will have a storage capacity of two million acre feet of water. It will submerge 38,000 acres. Some idea of the stupendous character of the project may be had from the following, taken from the third annual report of the Reclamation Service:

The Rio Grande is essentially a torrential or storm water stream, subject to great floods, so irregular in their occurrence that the total flow in some years is less than one-tenth of the total flow of other years. The Rio Grande is a very muddy river. It carries in suspension a percentage of silt that varies from year to year and from month to month, but that is sufficient to have made a mud deposit in the last seven and one-half years equivalent to 1.8 per cent of the total volume of water that has come down the river. It appears that the best solution of the mud question, as well as of the storage question, is the construction of one big reservoir of great depth, with a capacity to store all the water and equalize the irregular flow over a number of years, and with a surplus capacity for mud storage, until posterity can take advantage of its great depth to sluice it out economically.

This was the reasoning that brought forth the great dam with dimensions as follows:

	Feet
Height from bed-rock to top of parapet walls	255
Height from river bed to top of parapet walls	190
Thickness at bottom	180
Thickness at crest	20
Length of crest	1150
Length at river level	400
Roadway—	
Below crest between parapet walls on each side	5
Wide	14
Depth of water from river bed to spillway	175
Spillway to have a length of	800
Reservoir	40 miles long
Storage capacity	2,000,000 acre feet

Will furnish 600,000 acre feet per annum for irrigation and will irrigate 180,000 acres of land.

This, then is the Elephant Butte Reclamation Project the culmination of centuries of irrigation in the Mesilla Valley, the largest body of artificial water of its kind in the world, the greatest irrigation project ever attempted, and issuing to the Mesilla Valley a generous, unfailing water supply from year to year, sufficient for every acre of land within the valley, making the farmer, great and small, independent of weather conditions, the yield to be had from his land depending solely upon his own intelligence and industry. With such backing it is small wonder that land in the Mesilla Valley and under this project is advancing in value by leaps and bounds and that from all sections of the world are coming demands for information about this land of certain plenty.

Land Under the Elephant Butte Project. The land under the Elephant Butte Project is held in private ownership and for the most part, is covered by land grants duly confirmed by the United States court of private land claims. This land can be acquired only by purchase from the owners. The land grants in Dona Ana County

The Santa Fe Depot at Las Cruces

cover a total acreage of 90,183 and a fraction, distributed in the following grants:

Dona Ana Bend Colony Grant	ACRES 35,399.017
Santa Tomas de Yturbide	9,622.34
Jose Manuel S. Baca	3,530.60
Refugio Colony	11,524.30
Mesilla Colony	21,628.52
Santa Theresa	8,478.51
Total	90,183.287

Of this area so held under confirmed grants from the Spanish or Mexican governments, several of the grants have been partitioned, or divided among the claimants, while others have been sold outright. Title in these grants is perfect. The land, for the most part valley land, is extremely fertile and prices range from $25 to $200 an acre, depending of course, upon location, character of soil, extent of improvements, development and the other conditions generally governing the value of real estate of this kind. In and around Las Cruces the price of land is higher, land suitable for town lots or market gardening being very desirable.

LAND OPEN TO HOMESTEAD AND DESERT ENTRY. Land suitable for agriculture in Dona Ana County is by no means confined to that which will be reclaimed by the Elephant Butte Project. There are now 1,923,176 acres of the public domain within the county open to entry under the land laws of the United States, of which 1,406,622 acres have been surveyed. Practically none of this land will be brought under irrigation by the Elephant Butte Project, but upon much of it an artificial water supply may be developed, chiefly by pumping from deep wells, a means of reclamation in which the experiment station at the Agricultural College has conducted extensive and satisfactory experiments.

CLIMATE. New Mexico has become famous, the whole world over, as "The Land of Sunshine". Its climate is peerless and the sheltered, sunny valleys are now recognized as ideal in all conditions for the health-seeker and particularly for the man or woman who is fighting the dreaded consumption and diseases of the throat and lungs. For the alleviation of these troubles the dry atmosphere, the great percentage of sunshiny days, and the mild temperature combine to make a climate almost perfect. The Government of the United States has given substantial recognition to the climatic advantages of New Mexico by establishing at Fort Stanton its great Sanitorium for the treatment of Tuberculosis in the Marine Hospital service, and the equally famous institution at Fort Bayard which cares for consumptive patients from the regular Army. These institutions are among the greatest of their class in the world and the results obtained at both have attracted the attention of scientists throughout the Nation.

Even as New Mexico stands for climatic perfection in America, so the Mesilla Valley is entitled to range among the most favorably located sections of New Mexico. Annually many healthseekers from all parts of the United States seek health while resting in the delightful sunshine and on every hand are found the happy, prosperous homes of one time health seekers, *people who have come in time.*

UNITED STATES RECLAMATION SERVICE
RIO GRANDE PROJECT NEW MEXICO
GENERAL MAP

Silver City and Grant County, New Mexico

SILVER CITY has a population of 4,500 and is located in Southwestern New Mexico on the A., T. & S. F. Railway. It is the county seat of Grant County and the commercial center of a large tributary section with a population of 20,000 people. Situated as it is in the very center of the richest proven mineral belt in New Mexico, and surrounded by millions of acres of rich grazing and agricultural lands, its stability and prosperity are assured for all time.

Street Scene, Silver City

Silver City was the first municipality incorporated in New Mexico, its special charter being granted by the legislative assembly February 15, 1878. The town is ably governed and its financial condition of the best. Its assessed valuation is $626,820.00. It has a splendid water works system, modern electric light plant, and telephone system connecting with all tributary camps and towns, and now building to join the long distance line at El Paso. There are two National banks and one Savings bank, and as an evidence of great increase in the prosperity of the community and the country surrounding, is cited the fact that the deposits in these institutions have increased from less than $250,000.00 in 1905, to $1,000,000 in 1907. Two miles of cement sidewalks are now under construction, and this improvement is to be at once extended to every street. A first-class sewerage system is being installed.

Silver City has the merited reputation of being the most substantially built town in New Mexico for its size, brick and stone being used almost exclusively. The fine business blocks, public buildings, schools, churches and attractive residence properties, give the place a decidedly metropolitan appearance. Nine miles east of Silver City is Fort Bayard, where the United States government has located the army general hospital for the treatment of tuberculosis. The public schools are as good as can be found anywhere, and a new fifty thousand dollar building is now under consideration. There is also located here the New Mexico Normal School, one of the leading educational institutions of the Southwest, having buildings and equipment to the value of $100,000.00. Another school that does exceptionally good work is the Academy of Our Lady of Lourdes for girls. The Comanche Mining and Smelting Company has its 600 ton smelting and concentrating plant at this point. The company gives employment to 500 men. Silver City has a number of other important industrial enterprises and is making rapid advancement in this direction. There are in Silver City three hospitals and two sanatoriums. Two newspapers are published. The hotel accommodations are strictly up-to-date. The town is growing and building at a rapid rate, and opportunities for investment are exceptionally good in almost any undertaking in which one might desire to engage. Thus far mines and stock have proven the most profitable, but there are many openings for small industries.

Five religious denominations are represented in Silver City, as follows: The Episcopal, Methodist, Presbyterian, Roman Catholic and Baptist. Each owns its own home and are in a flourishing condition. They are strongly supported, both morally and financially, and play an important part in the civic life of the community. However, the morale of the town is high, and persons who come here expecting to find a rough mining camp are agreeably disappointed, as there is no more orderly community in the East or West than Silver City. This is a matter of frequent comment on the part of visitors, and has been an important factor in the up-building of the community. Silver City is a town of home-builders, and boasts of some of the handsomest residences in the Southwest. Brick, stone and cement are used almost exclusively in building, there being but few frame residences in the town. A conservative estimate of the amount spent within the last year in home building, based upon reliable information obtained from the contractors and builders, is $75,000.00. The location of the town, protected on all sides by high hills, its dry atmosphere, and its almost constant sunshine render it a pleasant and healthful residence place.

MINERAL PRODUCTION. Grant county is the first in mineral production in New Mexico, and all the principal operations are conducted within a comparatively short distance of Silver City. The mountains are literally ribbed with all the minerals and metals most useful to mankinl. Gold and silver have been produced from the mines for the past forty years, while Grant county is proud of the distinction of having the oldest copper mine in the United States—the Santa Rita Del Cobre—which was worked by the Spaniards more than a century ago, and which as early as 1807, yielded an annual production of 20,000 mule loads of copper. However, it has been only in recent years that capital has sought investment here

Academy of Lourdes, Silver City

and made mines out of what heretofore have been prospects. The variety of minerals is great. Copper and silver are the chief products, but gold, lead, iron and zinc in their various forms are found in abundance.

Pinos Altos, nine miles north of Silver City, is the leading gold camp. In order to facilitate the transportation of ores the Comanche Mining and Smelting Company has constructed a narrow gauge line of railroad from its smelting plant at Silver City to Pinos Altos. The name of this line is the Silver City, Pinos Altos & Mogollon Railroad. There are many good mines in this district upon which development is being done with the most satisfactory results. Nine miles east from Silver City is the Central District, embracing the sub-districts of Hanover, Fierro, Santa Rita and other outlying points. This district is one of the largest producers of copper and iron in the Southwest, and is conservatively estimated that one thousand tons of ore are shipped therefrom daily, and employment afforded to 2,500 men. Such well known companies as the Santa Rita Mining Company, the Hermosa Copper Company and the Colorado Fuel and Iron Company operate extensively in the Central District. The camps of Santa Rita, Hanover and Fierro are connected by rail with the Santa Fe by a branch to Whitewater Junction. The Mimbres District lies northeast of Santa Rita, and at its south end is the Carpenter District. The former is rich in silver and the latter in lead and zinc.

City of Rocks, Near Silver City

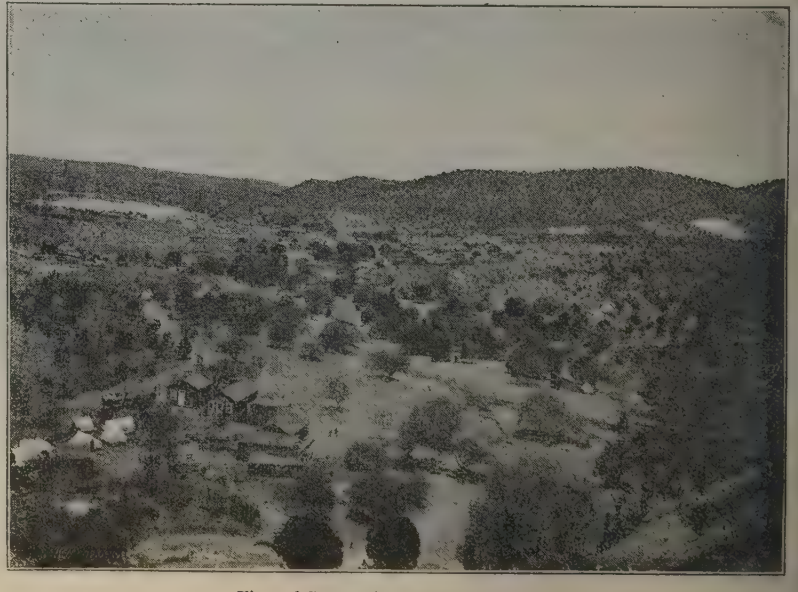
The Burro Mountain District lies about fifteen miles southwest of Silver City. It first came into prominence by reason of its turquoise mines and has recently become a great copper producer as well. Large amounts of capital have been expended in development work in this district within the last twelve months, and have resulted in the discovery of some of the largest bodies of copper ore ever found. The principal operations are being conducted by the Burro Mountain Copper Company at Leopold and the Chemung Copper Company at Tyrone, each camp numbering over one thousand people. At Leopold a 300-ton concentrator is kept in constant operation and at Tyrone a 1000-ton concentrator is projected. Surveys have been made for both standard and narrow gauge lines of railway to these camps and the construction of one or both of these lines is assured. From Chloride Flat District, one mile west of Silver City, $3,250,000.00 worth of silver have been taken. Other tributary districts are, Cow Springs, Black Hawk, Clark's Peak, Gold Hill, Malone, Anderson and Telegraph.

Ninety miles north of Silver City, the nearest railroad point, are the Cooney and Mogollon mining districts, which have yielded several million dollars in gold, silver and copper. One mine alone produced more gold and silver in 1906 than all the other gold and silver mines in New Mexico combined. It is one of the most highly mineralized regions in the Southwest, and extensive operations are being carried on by the Ernestine Mining Company, the Mogollon Mountains Investment Company, the Mogollon Gold and Copper Company and the Enterprise Mining and Milling Company. To summarize: The approximate value of the mineral output for 1906 of the district tributary to Silver City is estimated at $5,000,000.

The climate of Silver City approaches the ideal, and for the relief and cure of consumption no better can be found anywhere. The altitude is 6,000 feet. Perpetual sunshine, a low degree of humidity and an equal temperature, never oppressive in summer and mild and tonic in winter, cool nights and a great purity of atmosphere have led even the United States Government to select this immediate locality as the ideal location for its great military sanatorium for consumptives. There are also two sanatoriums located in Silver City, the New Mexico Cottage Sanatorium and St. Joseph's. Probably no country offers a greater amount of sunshine. For 320 days in the year the skies are cloudless, 45 partially cloudy and 20 are overcast, and yet there is not really a day in the whole 365 which one may not spend comfortably out of doors. The government record for this region gives a mean annual temperature of about 55 degrees. The greater portion of the precipitation occurs in the months of July, August and September.

There are a number of mineral springs adjacent to Silver City which have proven to possess remarkable medicinal qualities.

In live stock interests Grant County ranks among the first in New Mexico, especially in cattle and horses, although sheep husbandry is by no means over-looked. In the neighborhood of one million dollars worth of cattle are now shipped annually. The raising of hogs and goats is also carried on profitably. Silver City is an important shipping point for live stock, and excellent facilities for this purpose have been wisely provided. Agriculture is also an important industry, the principal sections being on the Mimbres and Gila rivers, both tributary to Silver City. The soil is rich and very productive. All the orchard products are grown and vegetables do well. There are about 150,000 acres adapted to agriculture in this section.



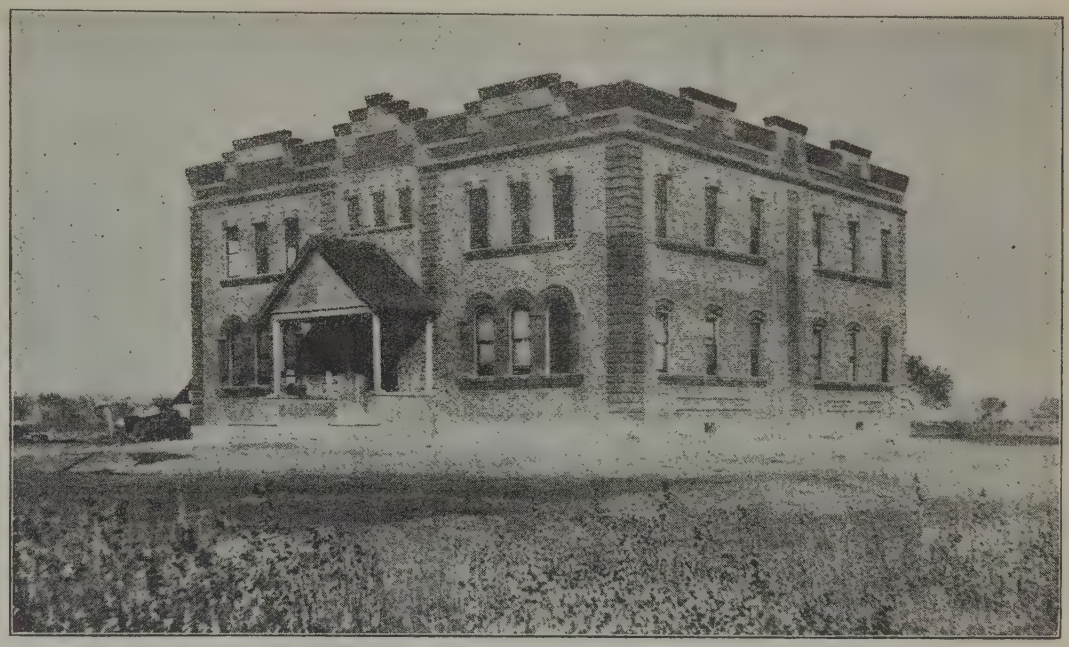
View of Santa Rita Mining Camp

Resources and Possibilities of Valencia County

VALENCIA COUNTY is bounded on the north by McKinley, Bernalillo and Sandoval Counties, on the east by Sandoval, Bernalillo and Torrance Counties, on the south by Socorro County and on the west by Arizona. It is the third largest of New Mexico counties, covering an area of 7,944 square miles, which is more than seven times the area of Rhode Island; more than four times the area of Deleware; and almost twice the area of Connecticut; and larger than Hawaii. Quite a large portion is included in private Spanish and Mexican grants, while about 401,000 acres are reserved. The county extends 236 miles from north to south.

Valencia County originally covered one-half the area of New Mexico; Socorro, Lincoln, Otero, Dona Ana east of the Rio Grande, Chaves, Eddy, part of Torrance, and southwestern McKinley counties were at one time included in this county, the county seat of which was at Tome, then at Belen, and at present at Los Lunas.

The population according to the census of 1900, was 13,895, an increase of over 50 per cent since 1870. The population is in greater part of Spanish and Mexican descent and the Spanish language is spoken among these descendants, although the young generation has learned to speak English in the public schools and English has overcome Spanish as the language of the business and professional men. There are 1,500 Pueblo Indians there who are being gradually assimilated by the white native population. These Indians are at the pueblo of Acoma, 492 inhabitants, and the Pueblo of Laguna, 1,077 population. The area and population of some of the northwestern precincts were reduced by the creation of McKinley County in 1901. On the other hand, several precincts show considerable increase in population since 1900, due to immigration caused by railroad building. One-half of the population of the county lives in the Rio Grande Valley. The assessed valuation is $1,359,786, but this gives but a faint idea of its real wealth, for the census of 1900 estimates the agricultural wealth alone at $2,173,000. There are 500,000 sheep owned in the county, and many horses, cattle and goats.



New Mexico Orphan Asylum, Belen

RIVERS. As the Continental Divide passes through the county, the waters of Valencia County are drained into the Gulf of Mexico through the Rio Grande and into the Pacific through the tributaries of the Colorado river. The principal stream is the Rio Grande, which passes through the county from north to south. There is a large area of irrigated land on both sides of the river along its entire course in the county. Between Los Lunas and Belen there are large alkali flats, once productive fields, which only need drainage to restore to them their former fertility. All along the river there is much waste bottom land, a portion of which above Los Lunas raises a scanty supply of coarse grass for grazing purposes. Below Los Lunas a large portion of the land is covered with cottonwood thickets. Where these are cut away the ground is found to be of excellent quality. No perennial streams enter the Rio Grande in Valencia County. The Puerco, however, which at times has a flood discharge of about 32,000 second-feet, flows in part through it, entering the Rio Grande in Socorro County. Along the Puerco and its tributaries something like 14,000 acres are under irrigation. The character of the county through which the Puerco passes is hilly and broken. Its altitude ranges from 4,000 to 7,000 feet, and the annual precipitation is very light, averaging only 7 inches. For that reason there are but few perennial streams in the whole drainage area. The major part of the precipitation occurs usually during the months of June, July and August in the form of very heavy rains or cloudbursts, resulting in torrents which for volume and duration are not exceeded in New Mexico—a maximum discharge of 32,000 second-feet having been observed on the Puerco. Such floods, however, are unusual—this being the maximum—but freshets discharging from 2,000 to 3,000 second-feet are comparatively frequent during the rainy season. Much the greater portion of the drainage area never furnishes water to the stream, the precipitation that reaches the arroyos being lost by seepage in the sandy beds. The Rio Puerco receives its entire perennial supply through a number of small streams from the western slope of the Nacimiento Mountains in Bernalillo and Rio Arriba Counties, but a small amount, however, reaches the main stream which is dry south of Casa Salazar, Bernalillo County, from the time the spring flow ceases until the latter part of November, with the exception of times of freshets. These freshets have again and again washed away the bridge of the Santa Fe-Pacific Railway at Puerco, but lately the company has constructed a breakwater of two rows of heavy piles driven into solid ground, the space between being filled with large blocks of sandstone cemented in place.

From Casa Salazar to the mouth of the Puerco there are no irrigated lands except at San Ignacio, where 500 acres are in cultivation. In years past most of the rich bottom lands south of Casa Salazar were under irrigation, but within the last fifteen or twenty years the Puerco has been cutting out its bed until now it flows in a tortuous channel with precipitous banks from 30 to 40 feet below the level of the valley, rendering it impossible with the crude methods of the farmers to raise water sufficiently to bring it upon the lands and causing the abandonment of that part of the valley. Modern irrigation methods, however, will untimately bring this land under cultivation again. On the small tributaries, the La Jara, Los Pinos, Rito, La Leche, and Rito del Nacimiento, irrigation is confined to small patches along the sides of the narrow valleys aggregating about 700 acres. From the east boundary of the San Joaquin de Nacimiento grant to Casa Salazar, between which limits irrigation extends and which is entirely included in Bernalillo County, the irrigated areas are not continuous, but are located about the small settlements and aggregate 2,980 acres. It is the main tributary of the Rio Puerco, the San Jose, and its tributaries, the Cebolleta and Colorado, which are in greater part in Valencia County. This stream rises on the Continental Divide, and, flowing southeast, joins the Puerco about 4 miles east of San Jose. The normal flow is small and is wholly consumed by irrigation along the stream.

During the rainy season it discharges enormous quantities of water, and it is the conservation of this that would increase the area under irrigation manifold. On the upper portion of the stream, at the junction of the Cottonwood and Bluewater creeks, the Bluewater Development Company has constructed a dam 42 feet high, impounding water for the irrigation of its lands 12 miles below. From this reservoir 2,000 acres are irrigated. There are no other storage systems in the county. The principal irrigated acreage on the San Jose is between the Indian Pueblos of Acoma and Laguna, about 3,900 acres being irrigated. About El Rito and Masita 800 acre are under irrigation, and these points mark the limit of irrigated acreage down the river. At Juan Tafoya about 200 acres are cultivated from springs in the canyon on the upper Salado, no further increase being practicable. In the vicinity of San Mateo about 600 acres are also served from springs, this acreage consuming the entire flow. In addition, 2,300 acres are in cultivation in detached areas throughout the county, this acreage consuming the entire independent water supply, with the exception of the early spring and the flood flows of summer. Only by storage can this area be increased. There are a number of reservoir sites available.

Church and Mausoleum, Belen

Another source of supply of water for irrigation purposes is the underground flow, which is very strong in many parts of the county, especially so in the Valley of the Rio Grande. Water can be developed at many places at a depth of only 25 feet, but thus far not much has been done in this line. The irrigation systems, except that in the vicinity of Bluewater, are antiquated and wateful, and if modernized would supply a much larger area.

Topography. Naturally in so large an area as that covered by Valencia County almost every variety of topography is found. The Continental Divide crosses the county from north to south. East of the Rio Grande the Manzanos are the principal mountain range, forming a watershed between the Rio Grande drainage basin and the dry mesas of the eastern part of the county. In the western part of the county the Zuni mountains and the San Mateo Range are the principal mountain systems. A vast lava bed extends the entire breadth of the county east of the Continental Divide.

West of the Rio Grande the mesas are much broken by arroyos exposing the strata of rock.

Minerals. Valencia County is rich in minerals, but thus far comparatively little has been done to make this mineral wealth available. Gold, silver copper, iron, sulpher, lithographic stone, gypsum, brick clay, salt, pumice stone, ochre, building stone, cement, potash, and, most important of all, coal in vast, almost limitless, quantities are found in the county.

In the Manzano Mountains rich copper prospects have been located, some of the copper found being almost pure. There are also indications of gold and silver and iron in large quantities.

The erosions that have cut Valencia County in so many places have also exposed layers of coal of inexhaustible quantity and good quality. Along the Puerco and west of the Divide, seams of lignite coal crop out of the arroyo or canyon walls in scores of places. A peculiar feature of some of these seams is that a layer of black shale, if traced for a short distance, passes into a seam of clear coal and vice versa. About ten thousand acres of these coal lands have been located by the Southern Pacific Railroad Company. In the Manzano Mountains good coal is also found. Undoubtedly the completion of the railroads now in progress of construction will lead to the development of many of these coal deposits.

Potash is found at Casa Colorado.

Magnetic iron ore is found on the Antonio Sedillo grant.

Taken in all and all, Valencia County presents one of the richest fields for the prospector and the investor in mining propositions to be found in the Southwest.

Valencia County has a large railroad mileage. The Santa Fe cuts through the eastern portion from north to south, entering the county south of Isleta and leaving it north of Sabinal, a distance of 25 miles, the principal towns on the line being Los Lunas, elevation, 4,832 feet; and Belen, elevation 4,785 feet. Other towns on or near this railroad are Peralta, Valencia, Tome and Jarales. The Santa Fe Pacific Railway enters the county at Rio Puerco and leaves it northwest of Bluewater, the distance being 80 miles. The principal towns on this line are Laguna, Grant, and Bluewater; while other stations are Garcia, Shawnee, Armijo, El Rito, Cubero, McCartys, Horace, Toltec and Baca.

The Colorado and Gulf Railroad has been surveyed through the western part and will have about 40 miles of track.

The cut-off which the Atchison, Topeka and Santa Fe Railway is building from Puerco, in Valencia County, to a connection with the Pecos Valley system traverses the county from east to west, crossing the Rock Island near Llano, the New Mexico Central at Williard, and the Santa Fe line from Albuquerque to El Paso at Belen, forming a junction with the Santa Fe Pacific at Rio Puerco.

Valencia County has about 300 miles of telegraph, and a telephone line extends from Albuquerque to Belen and Los Lunas.

Agriculture. Agriculture is one of the chief industries. The lands under irrigation are very fertile and the climate is perfection itself for the raising of grain, vegetables, and fruit. Irrigation permits the husbandman to water his land when it is needed and to withhold moisture when it is not necessary. This prevents crop failures and permits plant life to attain that perfection which it never reaches in the more humid zones. Wheat grown in the vicinity of Belen captured the first premium at the World's Fair at Chicago, and again a gold medal at the Charleston Exposition, the wheat weighing 60½ pounds per bushel. Oats grown on a farm six miles from Los Lunas took the second prize at the Columbian Exposition. The principal crops are wheat, barley, oats, corn, alfalfa, and all vegetables and fruits of the south temperate zone. Some of the finest vineyards in the Southwest are found in the county. Grapes are grown in large quantities, the mission grape predominating, but other varieties, such as Tokay, Sultana, Concord, Muscat, and others doing exceedingly well. Alfalfa is a staple crop. In the Zuni Mountains and several other hill districts crops are grown without irrigation, as the rainfall is sufficient to mature them. The country affords many opportunities to the farmer and the fruit raiser. Land under cultivation can be

bought very cheaply, while vast tracts of government land are available to the homesteader and need but the touch of water to make them great producers of grain, vegetables, and fruit. The average yield is 30 bushels of wheat, 40 to 50 bushels of barley, 60 bushels of oats, 35 bushels of corn, and 5 tons of hay to the acre.

Stock. Valencia County includes the best stock-raising section in the Southwest. The mild winters, cool summers, good water, nutritious grasses, and sheltered valleys, and canyons have attracted both cattle and sheep grower. The county is one of the leading sheep-raising sections of New Mexico, there being 400,000 or more sheep on its ranges and thousands of cattle and horses. Lately some attention has been paid to the raising of goats, and the success is such that the number of these animals will be very much increased during the next few years.

Manufacturing Industries. An excellent quality of wine and brandy is manufactured at Belen. At this place is also one of the largest flouring mills in New Mexico. At Laguna and Peralta are fine modern flour mills. The existence of large quantities of coal, of raw material in the shape of wool, hides, minerals, and agricultural products, the possession of much railroad mileage, destine Valencia to be an industrial section of no mean proportions.

Belen Roller Mills

Timber. The county has some of the finest timber lands in New Mexico, which of late have attracted the attention of lumbermen and capitalists. The so-called Mitchell tract in the southwestern part covers 300,000 acres, on which it is estimated there are 2,000,0000,000 feet of good white pine lumber. The American Lumber Company, a syndicate capitalized at $8,000,000, cuts this timber and has erected extensive sawmills, as well as sash, door, and box factories at Albuquerque. A logging road is build from Thoreau on the Santa Fe-Pacific to the tract . The company has also secured the timber lands belonging to the Santa Fe-Pacific Railway in the same part of the county. It is not the intention to denude this region of its timber entirely, but to cut merely the mature timber and permit the young timber to grow up in place of that cut down. In the Zuni as well as in the San Mateo Mountains, there are splendid tracts of timber.

Climate. The climate is as nearly perfect as can be found anywhere. The varying degrees of altitude give sufficient variety to make it beneficial to every case of lung and throat trouble. The winters are much milder than in the northern part of New Mexico, and summer nights are always cool, while the year round the air is dry, light, and invigorating. Outdoor life in a climate like this is a certain cure for incipient consumption and throat trouble, and is also a panacea for many other ills.

Education. Of late years great progress has been made in public education. Every district has a public school and the school term ranges from three to ten months, in accordance with the resources of the school district. There are several good sectarian schools at the principal settlements, while the nearness of the University at Albuquerque and the New Mexico school of Mines at Socorro are a great advantage to the young people of the county.

Attractions for Tourists. There is good hunting and fishing in various parts. The broken nature of the country affords many picturesque natural sights. The primitive ways of living in most of these settlements, as well as the Indian pueblos of Laguna and Acoma, attract many tourists. Laguna is one of the largest and most populous Indian pueblos in New Mexico. Acoma, the Sky City, and the Enchanted Mesa are world famous. The classic tale of Charles F. Lummis of the Enchanted Mesa has traveled far and wide, and for years the former picturesque home of the Acoma pueblos, perched like an eagle's nest on the summit of an almost inaccessible cliff, has been the mecca of numerous pilgrims. The Enchanted Mesa rises sheer 700 feet above the surface of the surrounding plain, about a mile distant from the present pueblo. A single narrow trail leads from the cultivated fields below to the top of the mesa. But one day, centuries ago, the narrow trail was destroyed and then the village was built in the valley below. The Indians are making considerable advance in civilization, and many of them find remunerative employment annually in the sugar-beet fields of Colorado. They make excellent pottery, for which there is a great demand among tourists.

In Abo Pass, as well as in the western part of the county, are found interesting pueblo and prehistoric ruins which have attracted and puzzled scientists and greatly interested tourists who like to visit out-of-the-way places not touched by advancing civilization.

El Moro, or Inscription Rock, as it is locally and generally known, is situated in Valencia County, just east of the McKinley County boundary, and 35 miles east of the famous Zuni pueblo, and 50 miles south of the Santa Fe-Pacific Railroad.

This picturesque and interesting historical cliff is located at the extreme southern end of the lava-strewn valley, the drainage of which forms a tributary of the Zuni River Basin. The valley meanders through mountains and high mesa lands in a southerly and easterly direction from the ancient and famed pueblo of Zuni, once the flower of the Seven Cities of Cibolla. On the southeast it is fringed with the dark line of the forest-covered Zuni Mountain range; on the southwest it is marked by a series of vari-colored sandstone cliffs, carved into fantastic shapes by the action of the elements. As progress is made southward these cliffs become bold and towering and form a veritable gallery of collossal natural monuments, which the tourist need not be told is El Moro, or Inscription Rock.

This majestic cliff of fine-grained sandstone projects several hundred yards east into the valley from the mesa line and dwarfs into insignificance every surrounding object.

Not a Gibraltar, and lacking the awful magnitude of El Capitan of the Yosemite, yet a more beautiful and imposing bit of scenery is not to be found in the United States. The rock covers about ten or 12 acres, and its sheer, smooth walls rise perpendicular to a dizzy height of several hundred feet. The base is triangular, narrowing to a rounded but comparatively thin edge at the eastern end. The stratification is slightly tilted, and the stone has a decided transverse cleavage. The action of frost has broken immense sheets of stone

from the cliff, leaving smooth patches of wall. The top stratum is much harder than that of the bottom, and has served as a shield to the softer material below, thus preserving the bold outlines of the rock.

It is not too much to say that no rock formation in the West, or, perhaps, in the world, is so well adapted to the purpose for which this table of stone was used. At least history does not record any collection of similar data. Here are records covering two centuries, some of which are the only extant memoranda of the early expeditions and explorations of what is now the southwestern part of the United States.

The coloring of this venerable pile is characteristic of the American desert. Here there are no frowning cliffs, no dark and blackened walls, no moss covered crags, and no somber dikes, but, like a beautiful flag for the first time unfurled, this glorious rock, resplendent in bright but softly blended hues, stands out in bold relief as if newly cleaved from the virgin formation. The prevailing color is a brownish gray, relieved by waved lines tinted by shades of red, yellow, drab, and bold dashes of kindred color.

On these smooth walls, usually under some projecting stratum, inscriptions were cut by the early conquerors and explorers, which have made this rock one among the most interesting objects on the continent.

Here in this remote and uninhabited region, in the shadow of one of nature's most unique obelisks, wrapped in the profound silence of the desert, with no living thing to break the silence, it is hard to realize that three hundred years ago these same walls echoed the clank of steel harness and coats of mail; that with the implements of Spanish conquest the pathfinders in the New World were carving historical records upon the eternal rocks.

Just what instruments were used it is difficult to say, but the oldest inscriptions, covering a period of over half a century, were cut with a round-pointed instrument, possible the point of a sword or Spanish verduguillo.

It is rather remarkable that these Spanish inscriptions, cut two hundred or three hundred years ago, should have outlived those of Americans made less than half a century ago. This is due to the fact that those cut by the Spanish adventurers were executed by a small pointed instrument, cutting a deep, thread-like groove or line, while the work of the American was done with the slash of the ever-ready jackknife, the defacer of almost every natural object in America not under the immediate surveillance of the police. The Spanish writer executed his lettering in script as neatly as if inscribing the record page of the Magna Charta. This is in marked contrast with the inscriptions of John Smith and others, which have the usual display of bad taste characteristic in defacing public property. A broad, open line cut in this sandstone is subject to obliteration by the action of sand-laden wind, while a fine, narrow mark is little affected.

On the south side of the rock, in the angle formed by the mesa and the projection of El Moro, there is a small spring under the overhanging brow of the cliff. This, doubtless, was the favorite camping ground of the ancient explorer and traveler passing through this arid region from the Rio Grande to Zuni, or, as it was then known, the Seven Cities of Cibolla. The old, well-worn road, now disused, passes around and under the very wall of El Moro, and this spring was the only one on this road within 30 miles or more in either direction.

Locally, Inscription Rock and El Moro are known as separate and distinct monumental rocks. The latter translated, The Castle, is the rock standing out in bold relief to the east, while Inscription Rock is the name applied to the formation to the west, which is a part of the mesa. On the other side, in the angle formed by the two, one extending east and the other south, is a great chamber or cavern, a natural amphitheater, where secure refuge from storm or human foe could easily be secured. It is here, too, that the only spring within many miles wells up, as if to make the natural fortification doubly secure. Upon these walls are many of the best preserved Spanish inscriptions, although there are quite a number 200 feet east, under the shadows of a stately pine tree, and on the north side of El Moro. Most of them are as plain and apparently as legible as the day they were written; especially is this true of the older ones, carved during the sixteenth and seventeenth centuries.

BELEN. Belen is situated 30 miles south of Albuquerque, almost the exact geographical center of Valencia County, on the west bank of the Rio Grande River. It has an altitude of 4,500 feet. Its population is somewhat over 1,200 souls, a public-spirited class of people, alive with energy, thrift, and ambition. The town is unsurpassed as to climate, location, and soil. The stretch of country in the center

of which the town is located can not be excelled for fertility and productiveness, Belen having an enviable reputation of being the center of a rich agricultural and sheep-raising district.

Belen stands above all other communities in New Mexico in that it has the largest retail merchandise establishment; the largest flour mill; it is the largest railroad shipping point in proportion to population; it raises the best grapes; it holds the first prize of the World's Columbian Exposition at Chicago for wheat in competition with the world.

Belen has seven well-established general merchandise stores; two general wholesale establishments; one wholesale liquor house; one roller mill; several hotels, saloons, restaurants, barber shops, blacksmith shops; jewelry stores, a business men's association, etc.; one weekly newspaper, two physicians and lawyers. The First National Bank of Belen is a new institution and promises to grow apace, since it is backed by several of the most substantial men in New Mexico. The Catholics as well as the Protestants have each a comfortable and commodious church edifice. In front of the Catholic Church stands one of the most artistic architectural monuments in the Southwest, the Felipe Chavez Mausoleum, built at a cost of $15,000 by the late Felipe Chavez.

The school facilities of Belen are very good, there being three schools, the Felipe Chavez Girls' Academy, the Becker School, and the public school.

The curriculum includes domestic science and duties. The attendance at the three schools is in the neighborhood of 300. Great attention is given to the selection of instructors, and the teachers are therefore persons of high scholarly attainments and qualifications. Strides are being made toward an even higher level, and Belen will soon be able to boast of school facilities of which many a larger town might be proud.

The railroad facilities of Belen are excelled by few cities in New Mexico. It has the Atchison, Topeka and Santa Fe Railway connecting the city with the extreme northern and southern portions of New Mexico, gives direct connection with the New Mexico Central Railroad, the Chicago, Rock Island and Pacific Railway, and the proposed Albuquerque Eastern Railway to the east, while to the west connection is given with the Santa Fe Pacific. All signs point to a continued and substantial growth in population and wealth brought about by the advent of the new Trans-Continental Railroad through the town. The new railroad, together with the natural site for a large city, the solid agricultural basis and location adapted for a trade center, as well as the varied natural advantages and attractions, will within a few years bring Belen into the front rank of New Mexico's cities. Already it is showing signs of considerable growth, and as it has been assured that the railroad interests intend to invest heavily at Belen in the shape of shops, roundhouse, etc., it will be but a matter of a short time when the present population will be doubled, and after that an uninterrupted, solid growth will follow.

Brief Sketch of The Dawson Fuel Company

THE DAWSON MINES are located in Colfax County, New Mexico. This great coal camp is owned by the same interests operating and owning the El Paso and Southwestern Railroad and the big copper mines in Arizona and Douglas. The manager of the Dawson Company is Mr. E. L. Carpenter and the general offices are at El Paso, Texas.

The railway owned and operated in connection with the mines connects with the Rock Island Railway System at Tucumcari, New Mexico, a distance of 168 miles and crosses the main transcontinental line of The Atchison, Topeka and Santa Fe System at French, New Mexico, 18 miles east of Dawson.

There are known to be three coal seams of workable thickness in the Dawson coal measures. The thickness of the seams varies, being from eight to eleven feet. The coal lies nearly horizontal, with little, if any, broken ground or disturbance of the formation. The Dawson Company owns more than 21,000 acres of land, all underlaid by this great coal vein, as well as many other seams, some of them being of very good workable character.

The system of working is by triple main, drift entries, double-cross entry, room, and pillar. The main adits upon the mines have attained a length of more than 2,500 feet. The mines are at present ventilated by means of 24-foot Vulcan fans, with a capacity of 235,000 cubic feet of air per minute each. Electricity is used for motor haulage inside the mines and from the mines to the partings outside. The haulage from the mines to the tipple is done by 30 horse-power Porter locomotives.

Between mines Nos. 1 and 2 is located the electric power house. The building is frame, 60 by 30 feet in dimensions. The plant consists of two (General Electric Company) direct-connection generators, combined efficiency 240 kilowatts; voltage 250, 1,000 amperes. Electric power is used to operate the coal-cutting machines, of which eight are in use; three Sullivan machines, with a capacity of 150 tons each per day of eight hours, and five Jeffrey machines, with a capacity of 100 tons each per day of eight hours. Four Jeffrey motors are in use for haulage from the mines to the parting outside; total capacity of four motors, 2,000 tons per day. In capacity, improved appliances, and economical methods this plant is unsurpassed by any in the West, and only in capacity can it be considered as second to any coal-mining plant either East or West. To enumerate a part of these improvements and equipment the following are the more important: A double trestle with two tipples and two chutes for loading cars. In connection with the tipples there are stationary and shaking screens for sizing coal for domestic and other purposes; also moving slate-picking table. Alongside the tipple and chutes is located the washery, where slack or other coal is automatically transferred from the screens and chutes, washed, and loaded into the lorries to be dumped into the coke ovens situated within a distance of a few hundred yards from the washery. The washery has a capacity of 1,000 tons in ten hours, and is equipped with 16 jigs and the necessary auxiliary machinery to operate them. The power for operating this plant is furnished by two sets of Stirling boilers of a combined efficiency of 500 horse-power. The power to operate the box-car loader and charge the coke ovens is furnished from the same source. One hundred coke ovens are already completed and more are being built as rapidly as possible, the foundations and stone work having been completed some time ago. Near by is located the blacksmith shop, built of iron, dimensions 70 by 30 feet. This shop is equipped with lathes, emery grinder, electric drilling machine, bolt and pipe-cutting machinery, and blower of ample capacity to run four forges. This department is in condition to do all the ordinary repair work. Power to run this machinery is provided by a 25 horse-power General Electric Company's motor. The tipple, washery, coke ovens, etc., just described are located about one and a quarter miles south of the mines. At this point also are located the carpenter shop, 30 by 40 feet; storage building, 30 by 60, and numerous tenement houses. The Company has erected many commodious dwelling houses, built upon modern and pleasing plans of architecture. Several of these buildings are boarding houses. These houses are all built much after the style of suburban-home architecture, pleasing to the eye from without and having modern improvements within.

Dawson is the name of the town, two miles south of the mines, where the offices of the company are situated and where the residences of the superintendent and other officials are located. The town lies in the beautiful Vermejo Valley, which is irrigated by the crystal waters of the Vermejo River. On either hand are seen orchards, which in spring fill the air with the fragrance of their blossoms and in fall are laden with luscious fruits, while the prevailing gentle winds come down the canyon pregnant with the perfume of the pines which adorn the eroded canyons and the table-topped sandstone hills upon all sides. Deer and wild turkey are to be found within five miles of the town, and mountain trout disport in the waters of the Vermejo River, which runs alongside the town. In this ideal location is situated the headquarters of the Dawson Fuel Company. Here is located the principal mercantile establishment of the camp. The building is 90 by 72 feet and of more than ordinary architectural beauty. A branch store is located nearer to the mines. Here also are located the pumping plant and waterworks. An abundance of pure water is obtained from the Vermejo Valley. The waterworks plant consists of a Cameron pump, 20 by 30 inches. The power is supplied by one 60 horse-power tubular boiler and one 40 horse-power Scotch marine boiler. Water is conveyed to different parts of the mines and operating plants by pipe line, and the same mains convey water to all the houses for domestic purposes. This coal-mining enterprise, as a whole, is a remarkable one by reason of the celerity with which is was initiated, installed, and put in successful operation.

THE CALL OF THE DESERT

In the dawn of time, in the long ago,
The Desert and River were friends;
The River stretch'd out for her his arms
And kissed her burning sands.

But soon came the time when the River boy
Was changing in many a way—
He rush'd for the Sea to sweeten its brine
With the love of his boyhood day.

The Sea took all that the river would give,
But sweeter it never would grow.
The Desert pin'd for the faithless boy
And his love of long ago.

She clothed herself in forbidding gray
And mourned without tears in her eyes,
Mirages she painted of happier days
On the azure blue of the skies.

And then came Man with his trowel and pick,
And, building a prison of stone,
Made the River give up his useless aim
And come back to his very own.

The wedding of River and Desert past,
They are living their honeymoon—
The dream that mirages have forecast
Will be no dreams very soon.

The Desert is young and a bride once more,
And thankful to Man for all.
She wants his kin to share her joys,
And is sending out her Call.

—"Globe."

The Mineral Wealth of New Mexico

By FAYETTE A. JONES, Economic Geologist

EIGHTY years ago, the country was thrown into a fever of excitement by the announcement of the discovery of gold in the vicinity of Santa Fe, New Mexico. The discovery was made at the base of the Ortiz Mountains, in the year 1828.

In those days news spread slowly, and it was three months after the actual discovery was made, before it become known on the banks of the Mis souri River, 800 miles away. The discovery was made late in winter, and the plowing season in the East was in full swing when the news became generally known. Visions of this far-away field, where awaited a golden harvest, were beheld each night, like Joseph of old; and sheaves of gold stood up and bowed down before those who had the courage to venture forth.

Excitement ran high and the first epidemic of "gold fever" had the country in its grasp. The mad rush was on and nothing could check its momentum. Plows that were active, as of today, stood in the furrow on the morrow motionless as a corpse. Fields of growing corn and waving grain were abandoned and given over to the weeds and wind.

Stephenson-Bennett Mine, in the Organ Mountains

This extraordinary discovery of gold, preceding the find made by Marshal at Sutters' Mill in California by twenty years, and antedating the discovery made on Cherry Creek in Colorado by thirty-one years, was far-reaching in effect and is to be considered the first call in the awakening of the West.

It was then that the first organized assault on the store houses of wealth of the Rocky Mountains was made, and the line of march definitely marked out the famous Santa Fe Trail. Now, at this date, that historical trail has become obliterated by the great industrial engines of progress of the Atchison, Topeka and Santa Fe Railroad, and those stirring times of gold mining in New Mexico, eighty years ago, have passed into western history.

The prelude just recited is given to call attention to the fact, that New Mexico, since the earlier days of mining activity and until within the last few years, has been more or less passed over in the hurry, skurry efforts to reach the more apparently inviting fields elsewhere in the West.

Since the year 1900 the tide of immigration is once more directed toward New Mexico, due to a certain realization of its vast undeveloped mineral wealth and agricultural possibilities. The meeting of the Sixteenth National Irrigation Congress and International Industrial Exposition, at Albuquerque, this year, is having a wholesome effect in inducing capital to develop many of New Mexico's dormant resources.

Let us briefly look into some of the avenues of New Mexico's mineral reserves, and if possible try to form some estimate of what these resources represent in the aggregate.

First and most important of any natural legacy to which New Mexico points with the greatest assurance and pride, is in its vast coal deposits. The exact areas of all the fields have not, as yet, been fully defined and mapped; but it is safe to say that at least an area of 15,000 superficial square miles are underlaid with coal bearing rocks.

The economical workable beds of coal of the whole of this area will not be far from seven and one-half feet in thickness; this would give appoximately, for the available coal supply of the Territory 100,000,000,000 tons.

So vast is this amount that the imagination fails to grasp it, and the figures appear meaningless.

Conservatively speaking, every ton of this coal in the ground is worth, at least one dollar in value; hence, this asset alone represents an empire of wealth of $100,000,000,000.

During the year 1907, the copper production in New Mexico was 10,140,140 pounds of metallic copper, showing a net increase over the previous year of seventy per cent. The percentage of increase is quite healthful and it begins to illustrate that New Mexico is destined to become an important factor in copper production in the near future.

The new camp in the Burro Mountains gives promise of rivaling any of the great camps in Arizona. With our present knowledge of the various low grade camps in New Mexico, not saying anything about any new camps which may be discovered in the future, it is fair to place their production, before their final exhaustion, at 12,500,000,000 pounds of refined copper. Placing this at 13 cents per pound, the present price of copper, we can conservatively count on an ultimate production amounting to $1,725,000,000.

The gold, figuring on a basis of the general average production as compared to copper, stands in the ratio of about one to five; so that we may safely place the ultimate production of gold at $345,000,000; this would include both lode and placer gold.

Since the ratio of the gold production to that of silver in New Mexico is about one to one, placing silver at its market value, this would imply that the two metals would become exhausted practically at the same time. We would then expect a production of $345,000,000 in silver before that metal would become prohibitive to mine, or in other words exhausted.

The production of lead to that of copper in New Mexico, stands in the ratio of one to fifteen. This would give a total value of the lead reserve of $115,000,000.

The zinc can be placed at about the ratio of thirty to one with the copper, which would give in round numbers, say $60,000,000.

The iron ores can conservatively be placed at not less than 50,000,000 tons and ought to command a value of $3.00 per ton in the mine, on account of their purity. This would place the total value of the iron ores at $150,000,000.

The gypsum beds can be approximated at not less than 1,000,000,000 tons. The plains of the "white sands" will supply nearly this amount itself, since it is considered the largest pure deposit of gypsum in the world. This product may be valued at 50 cents per ton, giving a total value of $500,000,000.

Inasmuch as building stone and materials such as granite, limestone, marble, clays for building and refractory brick, cement material, sand, etc., exist in practically unlimited quantity, and that the supply of these materials will never become completely exhausted, howsoever great the demand might be, these things will not enter into the estimate of those economic minerals that would seem to have a limit in their reserves.

The above minerals and their estimated values of the ultimate wealth of New Mexico may be given in the following summation:

Coal	$100,000,000,000
Copper	1,725,000,000
Gold	345,000,000
Silver	345,000,000
Lead	115,000,000
Zinc	60,000,000
Iron	150,000,000
Gypsum	500,000,000
Miscellaneous	75,000,000
	$103,315,000,000

These figures, as great as they may seem, should be considered only the minimum value of the mineral reserves of New Mexico, below which the true value can never fall, but beyond which, conservatively speaking, it must lie.

Since the quantity of each of these resources is necessarily circumscribed, and as the wants of mankind tend to increase as the years advance, it can therefore, with assurance, be predicted that the time will ultimately arrive when the reserve of each useful mineral will become exhausted.

The time of their exhaustion will vary directly with the demand for their use, and inversely with the extent of the reserve.

The iron reserves will in all probability become exhausted (excepting some of the inferior grades) by the year 1960; and the younger generation will live to see this prediction fulfilled.

The coal supply of the Territory, as vast as it is, will be the second to disappear, and will not quite last until the new century of 2100 is ushered in.

The time of exhaustion of the other resources, possibly copper excepted, will extend over many centuries, yea, thousands of years; in all probability their exhaustion will only be marked by the ultimate extinction of the human species on the planet.

CAPITALIZATION OF MINES

The nominal capitalization of a mine is one thing and the actual capitalization is often quite another.

For certain purposes the nominal or charter capitalization is the proper basis of calculations and for certain other purposes it is not. Usually the practical basis is the price at which the stock is selling.

A familiar example will illustrate: The legal or charter capitalization of the Calumet and Helca is $2,500,000; par of shares, $25. But the stock was first sold by the company at $12 a share. Therefore as a basis of investment the actual capitalization was $1,200,000. But February, 1907, the stock sold for $1,000 a share, and for investment purposes the capitalization then was $100,000,000.

There is an awful lot of ignorant cuteness paraded around this country by chuck-heads who think it looks sharp and "onto the game" to talk about over-capitalization. It is all ignorant nonsense. In practical effect, to the investor there is no such thing as over-capitalization.

It makes no difference to the investor whether the charter capitalization is one or one hundred millions. The consideration with the investor is only to know if the property, all conditions taken into account, has the value that the stock is selling at. The legal capitalization doesn't in the slightest disclose the actual value.—Fitz-Mac.

Facts and Figures About Alamogordo

THAT superb little city of the Southwest, the land of sunshine and fruit, is possessed of every attraction found in similar communities of this broad and varied country, besides having among its own peculiar charms an ideal situation, a glorious climate and an almost tropical vegetation, unequaled elsewhere and which combine to make it without question the most beautiful town in New Mexico.

LOCATION. Alamogordo lies at the foot of the southern terminus of the Rocky Mountains and at an altitude of 4,312 feet above the sea. The Sacramento Range, four miles distant, extends toward the north for about ninety-five miles with a width varying from five to forty-five miles.

From innumerable canyons wending their courses from the heart of the mountains, flow streams of water that irrigate the surrounding country and give to Alamogordo its abundant vegetation and tropical appearance. Toward the west, in contrast to this verdure, is a long, unobstructed view to the famous fields of white sand. Ten years ago where Alamogordo is now located was a desert; today the population is 4,000. A few years ago where mesquite bushes grew, substantial buildings have been erected, and miles of streets are lined with trees, whose branches almost meet in the center.

Alamogordo is on the main line of the El Paso and Southwestern Railway.

CLIMATE. No section in the Southwest possesses a climate so nearly ideal for the cure of tunberculosis and other diseases as Alamogordo. Go to Colorado, California, Florida, to the noted resorts of Europe for relief, but come to Alamogordo, New Mexico, for a cure, where the climate, combined with rest and proper nourishment and treatment, will arrest many cases of tuberculosis, that may not be even benefited at other places.

Tennis Court at Cloudcroft

Professor Moore, Chief of the Weather Bureau, says: "Climate affects the health, happiness and well-being of people more than any other condition that goes to make up their environment. * * * The ideal climate as regards equability of temperature and absence of moisture does not exist in the United States, but the nearest approach to it will be found in the great Southwest. The temperature of the Southwest is not equable in the sense of having an extremely small daily range, but it possesses the quality of annual uniformity in a greater degree than will generally be found except on the sea coast, and there the humidity is great."

Since 1902, clear days have averaged above 225 per year, while the greatest number of cloudy days recorded in one year was 27. There is no prolonged or heavy wind movement, on account of the protection afforded by the mountains, though there is invariably a refreshing breeze day and night, the nights being invigoratingly cool. Sunstroke is unknown. The seasons, spring, summer and fall, are long, while the so-called winters are bright, short and dry. The air is pure, there being no natural or artificial agencies in the vicinity to contaminate it.

There is in the Southwest a thermometrical phenomenon, where altitudes are high with an absence of moisture in the atmosphere, termed "sensible temperature" or the degree of heat which is felt, which is 22 to 28 degrees less than the thermometric reading; thus a temperature of 100 degrees. Alamogordo's highest temperature for June, July, August and September, is reduced to 72 degrees, the heat we actually feel.

A HEALTH RESORT. Four miles distant is the Fraternal City Sanitorium at the base of the Sacramento Mountains, one of the most perfect institutions in the world for treating tuberculosis; it has accommodations for 150 patients and the constant care of competent physicians and nurses. The directors selected this site after investigating other towns (in New Mexico), deciding that Alamogordo, because of climate, altitude and natural protection from severe weather and its unrivaled water supply was the ideal location for such an institution. The sanitorium has a "co-operative" plan, the philanthropists who erected it intending to minimize the cost of treatment by paying no dividends, but returning profits to patients in reduced cost of treatment. Before being admitted any applicant must correspond with the physician in charge, who will notify applicant of the decision. This will be enforced in order that absolutely incurable patients will not journey to Alamogordo expecting to be admitted and then be refused.

AGRICULTURE. The valley about Alamogordo is strictly an agricultural region, producing alfalfa, hay, wheat, oats and corn. Alfalfa produces five cuttings per year, averaging seven and one-half tons per acre, which is marketed locally at an average price of $15.50 per ton. Hay yields two tons per acre per year, the average market price of which is $16.00 per ton. The finest garden vegetables in the United States are grown all over the valley.

The National Irrigation Congress, to hold its annual convention at Albuquerque, in the fall of 1908, demonstrates the prominence New Mexico has attained as an agricultural and fruit growing region by irrigation. Water may be reached at a depth of from forty to sixty feet anywhere adjacent to the city, and windmills or power pumps, used extensively for this purpose, large areas may be profitably cultivated. The percentage of soil moisture is about one-fifth of that of arable land, heavy late summer rains penetrating the soil not more than fifteen inches, which quickly evaporates into the atmosphere. The average precipitation for seven years was eleven inches per year.

IRRIGATION. From the noted La Luz (The Light) Canyon runs a torrent of water the year round, used to irrigate land about Alamogordo. At its mouth a dam and reservoir will be constructed to impound water sufficient to irrigate 20,000 acres. A hydro-electric power plant at this point will have a capacity of 2,500 horse-power, conveyed to nearby towns, including El Paso. It will be available to pump water from wells for irrigation. Scientific irrigation is practically unknown and in rare instances practiced in New Mexico. With experimenting, study and intelligence, it will be found that the acre-foot of water now used to irrigate can be reduced to a fraction of an inch. In the Alamo Canyon are springs furnishing Alamogordo with the purest and coolest mountain spring water for domestic purposes. This is piped eight miles to the town, from its source 4,000 feet above and stored in two cemented reservoirs of a capacity of 1,000,000 gallons, kept entirely fenced in and impervious to man or animal. The reservoirs, scrubbed out every thirty days, give Alamogordo the purest water supply in the world at lower rates than any other American city.

A Summer Family

FRUIT RAISING. Fruit raising in the Sacramento Valley is in its infancy, few orchards being cultivated on a large scale by scientific methods. The climatic conditions combined with pure mountain water and the excellent soil makes the valley second to no other fruit district. Peaches, pears, apples, apricots, prunes, grapes, berries, cantaloupes and watermelons grown here are superior to the California or Colorado product, and it is impossible to supply the demands for this fruit, at the highest prices. The Alamogordo Fruit Growers' Association has been organized and 300 acres of cantaloupes to be produced in 1908 will be shipped by fast refrigerator cars to northern and eastern markets.

Tularosa and La Luz, smaller towns, a few miles north of Alamogordo, offer inducements in an agricultural way, being part of the Sacramento Valley proper. At these places, many years older than Alamogordo and settled before the railroad was built, broad acres of alfafa and thriving orchards give evidence of the wonderful fertility of the soil. The same opportunity for homesteads exists here as at Alamogordo, thousands of acres of rich valley land being open for settlement under the homestead law. Tularosa has an enterprising commercial club and the town is growing rapidly.

STOCK RAISING. Horses, cattle, sheep, hogs and goats are raised with considerable profit, being allowed to graze on government forest reserves at a small charge per head. At Alamogordo is located the executive government office for the Sacramento forest reserve, where applications for the grazing of cattle will be received. Goat raising in the mountains is fast becoming a leading industry. The Mohair finds a ready market at top prices and the cost of maintaining a herd is practically nothing.

MINING. The Sacramento Mountains are not known as a mining region but there are paying gold, silver and copper properties within ten miles of Alamogordo. The rock is mineral bearing and its formation indicates pay ore in quantities at depth. Little work has been done to develop this field but experienced mining engineers believe that untold wealth awaits discovery and development. The Hunter Copper Company, a $1,000,000 enterprise at Highrolls, has been shipping for several years a high grade copper.

CLOUDCROFT. The story of Cloudcroft must be incomplete. Its beauty baffles the power of pen to portray or the artist to transfer.

Nature and man worked together to make Cloudcroft what it is—a summer playground, a summer Paradise—combining all modern comforts, yet keeping close to nature. Nature provided high-vaulted skies, bright sunshine, cool breezes, fields of clover, fields brimming with flowers, and a great pine forest sheltering birds and chipmunks and all the shy wood kin—all this in a croft of the Sacramentos. Man built a railroad up the mountains, made bridle paths through the forests, built the "Lodge," and laid out pleasure grounds for the summer colony.

The principal interest of Cloudcroft centers in the hotel, the "Lodge," because that is where one eats and sleeps. It is a rambling two story wooden building, with rustic balconies and verandas on each side. It looks, and it is, comfortable.

This is an "Incomplete Story." We have said Cloudcroft is beautiful. Just how beautiful it is, you must go and see for yourself.

LIFE AT THE LODGE. A summer at the "Lodge" is certainly a never to be forgotten pleasure. We suggest that you avail yourself of the opportunity.

If your tastes turn to pleasures, such as golf, tennis, baseball, bowling, riding, hunting, mountain climbing, autoing, pool, billiards, bridge whist; if you prefer books, art or Nature you will find the atmosphere and the accompaniments at Cloudcroft. Life at the "Lodge' is different every day and each night gives added pleasure. In the evening—amateur theatricals, "stunts," parties, concerts, cards, kindred spirits grouped around the great log fires, happy crowds tripping the "light fantistic" over a perfect floor to perfect music—this is only a sugestion of life at the Lodge.

Then, when the last waltz has ended, when the fires in the rotunda grow low, you creep under three wooly blankets to dream of all delight. The music of the pines and the fragrant mountain balsam woo you to sleep.

A life full of wholesome pleasure, free from care or worry, is what awaits you—if you go to Cloudcroft this summer.

THE TOWN. Alamogordo is the county-seat of Otero County and 1415 miles distant from Chicago, 1375 miles from St. Louis, 864 from Kansas City and 86 miles north of El Paso.

A substantial and ornamental court house is one of the many prominent buildings in Alamogordo. Adjoining the court house is the 'court house annex," where the public library is located. Provision has been made, in laying out the city, for all public buildings to be grouped in a manner to form the most pleasing picture. All household necessities for the comfort of the residents are supplied by the grocery stores, bakeries, markets, confectioneries, drug stores and laundry. Other lines of business, such as wagon and blacksmith shops, furniture houses, planing mills, and brick company, bottling works, ice plant, hay and grain dealers, photographers, physicians and stationers, are well represented. Two

Summer Flowers

good weekly papers are published and the El Paso daily papers are received the day of issue. The town is lighted electrically and has both local and long distance telephones.

The Alamogordo Lumber Company, with a capacity of 125,000 feet of lumber a day, located here, gives employment to over 100 men. Three miles from town is located the Alamo Marble Company's quarry, producing an unlimited supply of stone pronounced by architects to be the finest in the United States. It is being shipped to El Paso in large quantities for the construction of large buildings there and extensive use is made of the stone in Alamogordo.

Two national banks with a combined capital of $75,000 and $270,000 deposits show a large increase in business during the past two years. Fraternal societies are well represented by Masons, Odd Fellows, Knights of Pythias, Red Men, Woodmen of the World and Fraternal Brotherhood. Presbyterian, Baptist, Methodist (North and South), Episcopal, Catholic, Seventh-day Adventists and Christian churches are well attended.

The Alamo Business Men's Club, composed of sixty of the foremost business men, is performing valuable work in improving the town and settling the nearby country with homeseekers, and in fostering the business interests of Alamogordo and Otero County.

Alameda Park. Not nearer than Los Angeles is there a park equal to Alameda Park in Alamogordo. It is a mile in length, wooded like a forest, with walks, drives, fountain, flower beds, a band stand where weekly concerts are given, benches for the tired, a lagoon with swans, wild and domestic ducks and geese, all contributing toward making this a delightful breathing spot and illustrating what can be accomplished by cultivation of this rich soil. Seven years ago the coyote and wild cat skulked among the mesquite bushes that grew where this beautiful park is now located. El Paso, 86 miles distant, would give a million dollars for this nature spot, already famous among the playgrounds of the country.

At the north end of Alameda Park is the Blind Institute, a territorial institution, recently provided for by the legislature. The work accomplished by this institution during the short time of its operation compares favorably with older and leading institutions of a like character in the United States.

Schools. Alamogordo's public schools, occupying two substantial structures, are unequaled in New Mexico as educational institutions, and under the efficient management of the present superintendent and corps of teachers, the school work has been raised to a high standard, carrying students through the high school grades.

The New Mexico Baptist College now has in course of construction an auxiliary building of stone, which will cost $7,000, offering the young men and women of New Mexico an opportunity to pursue the higher branches of education. It would be impossible to find a more suitable location than the one occupied by this college for the pursuit of knowledge and spiritual as well as physical development. The sexes are not segregated, the faculty believing in co-education.

The Lodge—Dining Room

Homeseekers. The Rock Island Railway provides the Alamogordo Valley with ample transportation facilities, and has inaugurated a series of homeseekers' excursions the year round at a rate low enough to permit the poorest to travel. As a result, the public lands of Sacrameto Valley are rapidly being settled by thousands of progressive citizens. There are 3,000,000 acres alone in Otero County subject to entry. Its total area is 4,384,000 acres. or 6,850 square miles.

Information. For the information of those contemplating securing land under the homestead law, the following points cover the laws relating to such entries:

Any citizen of the United States, widow, or unmarried woman twenty-one years of age, may file upon 160 acres of government land, the cost of which filing is $19.00. The applicant then has six months in which to go on the land, and after having actually lived upon the land for fourteen months, can then commute the land and secure a deed by paying $1.25 an acre, or, at the option of settler, may reside on the land four and one-half years, and without paying anything additional, secure a patent for the land.

The Alamo Business Men's Club, mentioned before, with its complete organization and facilities for accurate and reliable information, will take pleasure in answering all inquiries.

Eagle Eerie—A Private Cottage

AGRICULTURE IN HAWAII

We are prone to think of the island, Hawaii, as possessing a tropical climate. As a matter of fact the average annual temperature is 74 degrees and the highest degree reached in summer along the coast is seldom more than 85 degrees. The winter temperature seldom falls below 50 degrees. For this reason the island is especially adapted for agricultural pursuits. Beekeeping, gardening and small fruit raising are very profitable. Stock raising is carried on quite extensively, and poultry keeping and dairying pays well. Eggs sell at from 25c to 60c per dozen and live chickens from $10 to $15 per dozen. Butter retails from 30 to 50 cents per pound and milk at 10 or 15 cents per quart. Besides these industries tropical agriculture can be carried on at a profit. The United States government has established an agricultural experiment station at Honolulu and frequent bulletins are sent out to encourage the industrial development of the territory.

Irrigation in the Arkansas Valley

By W. M. WILEY

E. P. Ripley

IRRIGATION in the Arkansas Valley began much as it did in other valleys, by taking small ditches from the river to irrigate the lowlands of the valley. This irrigation was mostly used for the purpose of growing hay and very few crops other than hay were attempted.

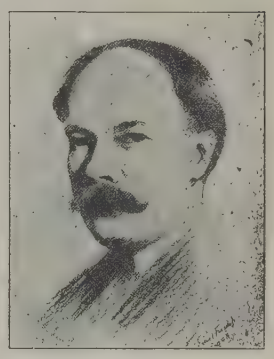
The first irrigation ditch in Colorado was the one constructed for growing garden truck at old Fort Lyon on the Arkansas river in 1834. The development of the vast bodies of irrigable land upon the plains of Colorado, reaching from Pueblo to the State Line, was started by the building of large ditches far out on the prairies about 1885.

George W. Swink

In the early '70s, Senator George W. Swink was located at a siding called Rocky Ford on the Santa Fe. Senator Swink had been raised a farmer's boy in the Middle West and the experience which he had there gained in agriculture enabled him to appreciate the wonderful results secured from farming under irrigation. The facts he had before him were, first, that the irrigated farm would respond to brains more than any other farm in the world, and, second, that because of this fact, the more brains a farmer had in an irrigated country the greater yield in dollars and cents he could secure and the more he could make his land worth. He dreamed of the time when settlers would take the place of cattle and the buffalo grass of the plains would yield to crops of intense cultivation. The problem which presented itself to him was to convince the renters and farmers of the East of the enormous profits which farming by irrigation would return. The Senator set about his task by developing the Rocky Ford Canal, (one of the oldest and best canals on the Arkansas River,) and the lands under it.

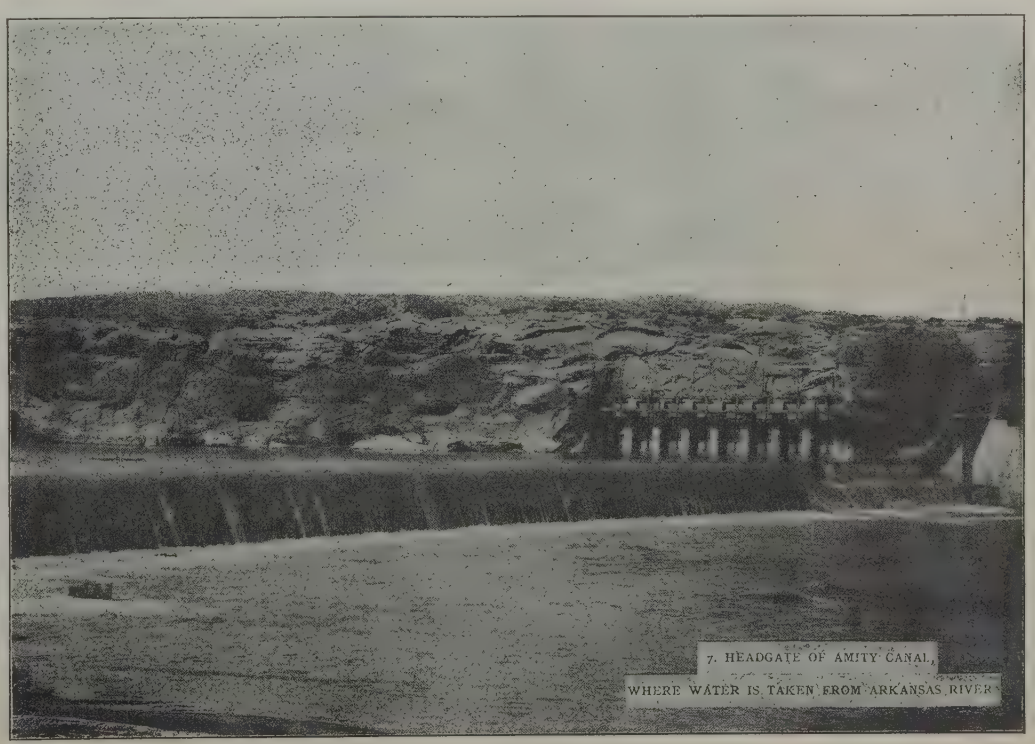
About this time J. E. Gauger, a man from the Middle West, began to grow what has since found fame as the Rocky Ford Cantaloupe.

Swink and Gauger began to push the industry of water melons and cantaloupes from this district. They first shipped in baskets to nearby towns and as the industry grew they adopted crates for shipment. The farmer of the Middle West began to hear Swink's voice as one crying in the wilderness and a few came out and settled around Rocky Ford to help him grow the wonderful melons, which the rest of the world seemed unable to duplicate. Along in the early '80s, canals carrying from 300 to 1,000 second feet of water were constructed, not only to cover the nearby lowlands, but the buffalo grass plains. One canal is 113 miles long.



Paul Morton

The vicissitudes and misfortunes, which has been the history of nearly all irrigation projects, overtook the promoters of these enterprises, many of which got into financial difficulties. The panic of 1893 increased these difficulties and left the valley with the canals constructed, but without money to maintain them in good shape, and found a few people who were located on them in an impoverished condition. Along in the early '90s, the great factor in the development of the Arkansas Valley appeared. This was the present management of the Santa Fe Railway Sytem. On taking charge of this vast property as President, Mr. E. P. Ripley, finding the lines of his road reached through thousands of miles



7. HEADGATE OF AMITY CANAL, WHERE WATER IS TAKEN FROM ARKANSAS RIVER

2. HEADGATE OF THE AMITY CANAL. ARKANSAS RIVER TO LEFT

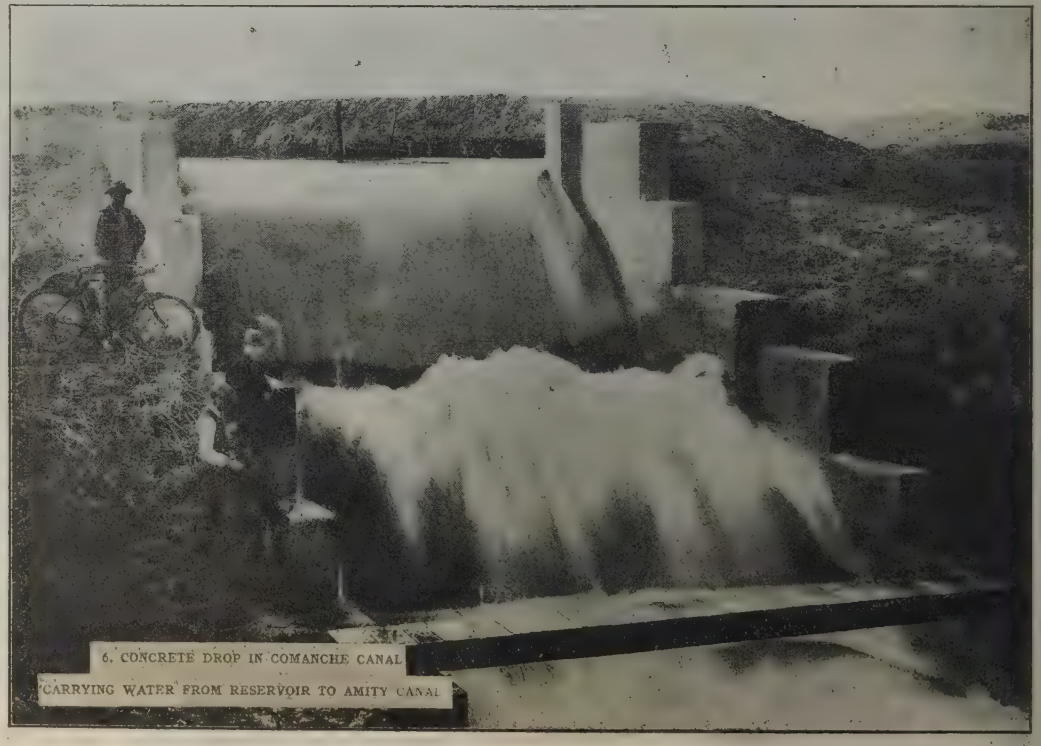
of unproductive territory, determined upon the policy of making each mile of road as highly productive as possible.

Mr. Paul Morton, as Vice-President of the Company and Chief of the Traffic Department, had the development of this policy under his immediate control. About this time the citizens of Lamar, Colorado, insisted on having Mr. Morton accept an invitation to a rabbit hunt. During the course of the hunt, Mr. Morton was driven far back on the plains from the railway and saw some of the magnificent country which was then under ditch and whose fertility depended only upon colonization. The interest aroused in Mr. Morton by this trip caused him to investigate the possibilities of the Arkansas Valley, the number of ditches that were already in existence, the amount of land it was possible to put under irrigation and to determine on what was necessary to assist in the colonization of this vast domain, which, when colonized, would make tributary to the Santa Fe one of the richest agricultural districts on the continent. As Senator Swink in the early '70s, for the benefit of the land which he owned, colonized the prairies with the people of his imagination, so Mr. Morton in the early '90s, for the benefit of his railway, colonized the prairies with the people of his imagination.

Word was passed down the line from the highest official of the Santa Fe to the most insignificant agent at a side track, that because it was beneficial to the Santa Fe, all of the employes of the company should work in harmony with the then citizens of the Arkansas Valley. The industries along the line were to be fostered and encouraged. Rates were to be made on incoming and outgoing freight for manufacturing purposes, which would increase the output of the factories and increase the territory in which the product could be sold. A nominal rate was made on alfalfa hay and sample carloads were shipped to Galveston, London, England, Kansas City, Chicago and St. Louis and local representatives of the Santa Fe at these points were instructed to try to find a market for it. The difficulty of marketing alfalfa hay so far from home forced the conclsion that the best market for the farmer was to feed lambs on his farm. The banks were asked to investigate the value of loans on sheep and arrange to lend the farmer the money with which to buy lams. Employees of the Santa Fe were instructed to aid the farmer in the purchase of his lambs. All of the different industries which promised profit to the farmer, were sought out, fostered and encouraged by all the employees of this vast system. Every agent of the Santa Fe Railway in the Middle West, resolved himself into a walking encyclopedia of information about the Arkansas Valley and colonists began to come in from every direction.

About this time the development of the manufacture of sugar from beets had brought this industry to a stable basis and the Santa Fe took up the matter with the American Beet Sugar Co., which was at that time dominated by the Messrs. Oxnard Bros., with a view of having a factory located in the Arkansas Valley. The particular advantage which this industry had, was that it paid the farmer a price for beets, which made beets not only a cash crop, but the best paying crop in the world. The officers of the Santa Fe were untiring in having experimental crops of beets planted, grown and tested; in sending their officers out in private cars with different officers of the sugar company and spending weeks at a time in demonstrating the adaptability of the Arkansas Valley to the culture of beets. The Santa Fe negotiated with the farmers for signing beet acreage and had one of its officials in his private car spend months in the Arkansas Valley, explaining to the farmer the value of the crop and methods and conditions of its culture.

As a consequence, the first factory of 1,000 tons daily capacity was built in Rocky Ford in 1900. The factory at Holly of 600 tons daily capacity was built in 1905. The factory at Lamar of 400 tons daily capacity was built in 1906. The factory at Garden City of 600 tons daily capacity was built in 1906. The factory at Los Animas of 600 tons daily capacity was built in 1907. There are now on the Santa Fe lines in the Arkansas Valley six sugar factories



6. CONCRETE DROP IN COMANCHE CANAL CARRYING WATER FROM RESERVOIR TO AMITY CANAL

with a nominal daily capacity of 4,400 tons and an actual daily capacity of about 6,000 tons.

For these factories about 65,000 acres of beets are grown, which, at an average of 10 tons to the acre at $5.00 per ton, gives a gross return to the farmer of about $3,250,000.00 in cash. The beets are paid for in cash on delivery to the loading stations. This amount of cash distributed among the farmers alone (the cost of manufacturing the beets into sugar is not considered) would make success in any farming community.

In addition to this the Santa Fe has assisted in the location of flour mills which pay cash for wheat; alfalfa meal mills which pay cash for alfalfa; sheep feeding plants; brick plants, and ice plants.

The receipts for their different stations which were in existence in 1890, have increased ten fold and in some cases twenty fold. The development of the Santa Fe busines has developed other values, and lands which sold for $20.00 an acre with water in 1895, now sell readily for $200 an acre.

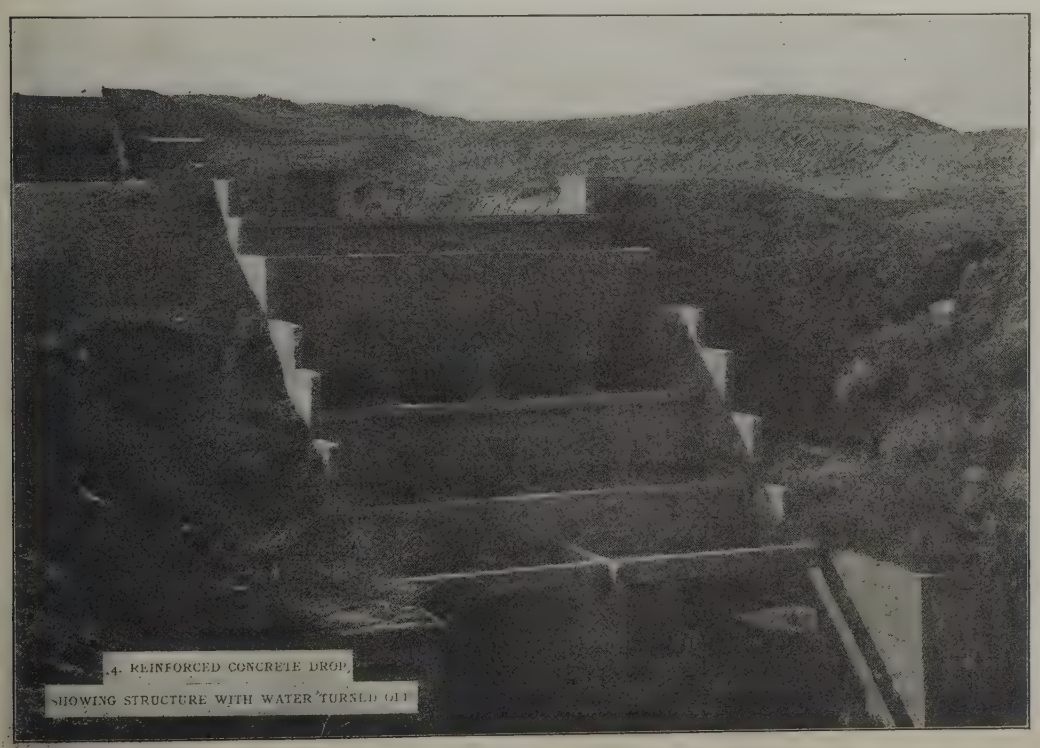
1. AMITY CANAL IN ITS COURSE THROUGH ARKANSAS VALLEY

The dream of Senator Swink has been realized. The bald prairie, which in 1870 and as late as 1890, showed nothing as far as the eye could reach but buffalo grass, a few cattle and an occasional prairie dog town, is now thickly settled by prosperous farmers and dotted all through the farm homes, are large school houses built of brick and cement.

We have surpassed the dreams of Senator Swink and have surpassed the dreams of Mr. Morton. The population and prosperity which their imagination showed them, have been more than realized. The man who knows the valley today and dreams of its future, sees cities where towns are and sees land (now selling for $200 an acre) selling for $300 to $500.

The valley still needs population and development, and as the population and development go on, values and prosperity must increase.

The one object which the lesson of this development teaches, is that the railway along which any irrigation proposition is located, must be made to see and understand the value to that company, which the development and colonization of any irrigable section means. Once having put this before the proper officials and having secured from them the hearty aid and co-operation without which no development in the West can be attained, the rest is comparatively easy.



4. REINFORCED CONCRETE DROP SHOWING STRUCTURE WITH WATER TURNED OUT

BUREAU OF DAIRY HUSBANDRY

The great dairy interest of this country, the largest single agricultural interest we have, is recognized only as an inferior division by the Department of Agriculture at Washington. It is placed under the control of the Bureau of Animal Husbandry with a paltry $50,000 with which to serve the 500,000 dairymen of the United States. No other branch of agriculture is organized as is dairying, yet no other has as little official recognition or influence at the seat of government. A number of interests, nowhere near as important, as, for instance, that of forestry or that of oils, are elevated to the dignity of bureaus, and are given a munificent sum of money to work along blind and indefinite lines. Most of all that the forestry people can do is to speculate on what can be done. Already three state dairymen's conventions, that of Pennsylvania, Ohio, and Wisconsin, have passed resolutions, asking that the dairy division be advanced to the dignity and efficiency of a fully equipped bureau. There is just as broad a scope for scientific and constructive work in dairying as in any other of the classifications under which the department of agriculture operates. We suggest that all active and energetic dairy farmers and cheese factory and creamery operators take a moment's time to write their members of Congress on this matter. Don't put it off till a more convenient season and thus forget it, but write now.

Development of the San Luis Valley

ITS TOWNS, RAILROADS, CLIMATE AND WONDERFUL FERTILE SOIL

THOUGH SOME of the first irrigation ditches constructed in the territory of the United States watered portions of the San Luis Valley, the developments of the last few years have made this part of Colorado almost as much new territory for the homeseeker and irrigation promoters as though it had just been discovered.

This valley lies in the south central part of Colorado, a small portion of it extending into New Mexico. In area it is about the size of Connecticut, being 100 miles long, north and south by an average of 40 miles wide, and lies between the Continental Divide on the west and the Sangre de Cristo Range of Colorado on the east, which, with their spurs, entirely enclose it.

Its geological history is that of a great lake or sea, fed by numerous glaciers, creeks and rivers of the surrounding mountainous watersheds, which brought down vast qantities of silt and soil to be distributed by the action of the water evenly over the bottom of the lake, filling and smoothing its inequalities until it became a level plain of rich soil, sloping gently from all sides to the center. Then by the slow cutting of the canyon on the south by its overflow waters the lake was drained.

The largest stream which fed the old lake was the Rio Grande del Norte (Great River of the North), having its source in the Continental Divide and entering the lake from the west side. As the lake was drained this river cut a new shallow channel for itself across the old lake bed to a point near its center, and then curving to the south found its exit through the canyon, the only outlet of the valley.

Three other streams, the Conejos, the La Jara and the Alamosa, were strong enough to find their way across the lake bed or valley, and join the Rio Grande. Numerous other streams, such as Rock Creek, La Garita, Carnero, Saguache, Cottonwood, Medano, Sand Creek and many others, flow into the valley, but their waters soon after passing the rim of the valley either sink or spread out over the surface, or both, producing great natural hay meadows.

SOIL. The character of the soil was determined largely by the nature of the silt and sediment brought down by the different streams into the old lake and deposited under the grading and concentrating action of the water, the prevailing sediment of the stream giving character to the soil of an area opposite its point of discharge and the mingling of the sediments of different streams to the soil of the interspaces. The soil varies from a heavy adobe (in limited areas) through a heavy, dark alluvium, to a lighter, very friable, sandy or gravelly loam. It is all rich and productive under proper irrigation and cultivation.

The lighter sandy and gravelly loams, contrary to what farmers unacquainted with arid soils would expect, have proven on cultivation to be especially rich and productive, and are today the highest priced lands in the valley.

SUB-IRRIGATION. Another characteristic peculiar to these last named lands is that they sub-irrigate, that is, they are not irrigated by flooding the surface, or by any of the usual methods of irrigating, but by simply allowing the water to flow into small lateral ditches placed from 100 to 300 feet apart. From these ditches the water soaks into the subsoil, saturates it, and comes evenly all over to the surface by capillary attraction and feeds the crop. By reason of this peculiarity of sub-irrigating, the cost of the labor of irrigating is reduced to almost nothing.

HISTORY AND DEVELOPMENT. Zebulon Pike was the first citizen of the United States to penetrate the San Luis Valley, and he returned to Washington after his hazardous trip in 1806 and reported this part of the Rocky Mountain region as being "an earthly paradise." It was then, however, Spanish territory. The first settlers were Mexicans who came in about 1846, establishing small settlements along the rivers which they used as base camps for the grazing of immense herds of sheep and cattle on the plain and the lower slopes of the mountains. Indian depredations drove them out until the United States garrisoned that part of its new possessions, and the Mexicans returned in large numbers in 1855.

The richness of the pastures of the valley brought in cattle men. They built small canals and planted grains, and showed that the valley, which had been supposed to be too high for successful farming, was in fact one of the greatest farming countries in the West.

About twenty-five years ago began a period of more rapid development and settlement. Many canals were constructed, deriving their water supply from various streams of the valley, especially from the Conejos, Alamosa, Rio Grande and Saguache Rivers. The largest and most important canals originated on the Rio Grande, being 20 to 60 feet on the bottom and extending 35 to 45 miles. From these main canals branch off hundred of miles of smaller laterals or distributing ditches.

THE GREAT "REDISCOVERY." Upon the magnificent foundation of irrigation development described in the preceding paragraphs, the new agricultural discoveries of the last few years have built a splendid new structure. So remarkable have been the advances of the last half decade just passed that this period is commonly spoken of as "The Rediscovery of the San Luis Valley."

The prime fact of this rediscovery is that the San Luis Valley possesses extremely favorable conditions for the growing and fattening of livestock, particularly hogs and sheep. The basis of these advantages is the field pea.

THE FIELD PEA. The field pea is not a new crop. It has been known to European farmers for centuries and annually thousands of acres of peas are raised in the northern part of the United States and in Canada.

But in all other places except the San Luis Valley three things have interfered with successful pea raising. In a humid climate the crop is a very perishable one. Both the vines and the peas are rich in nitrogen and decay easily if damp, and the vines are subject to many mould diseases. The vines being long and tough, it is a hard crop to harvest. Peas will grow only while the weather is cool, and if the temperature and humidity rise, the peas are spoiled. The climate of the San Luis Valley is such that all these three difficulties are met and overcome. The San Luis Valley is

high, so that it is always cool. The climate is very dry, so that neither dampness nor moulds nor slimes nor other diseases can affect the pea crop. And the San Luis Valley has a very dry open winter and fall, so that the farmer does not harvest his crop, but leaves it to cure on the ground, where the hogs and sheep consume it with very slight waste. An acre of pease will produce nearly twice as much animal fat and flesh as an acre of average corn, while the cost of production is less than half as much as corn.

The first use made of the peas when their astonishing adaptability to the climate and conditions of the San Luis Valley was demonstrated about five years ago, was to graze lambs upon them. This business proved so profitable that from an output of 1,600 fat lambs six years ago it has increased to more than 400,000 head in the season of 1906-07.

Of the number fed, probably one-third are from flocks owned in the valley, and grazed winter and summer on the surrounding mountain ranges. The remainder are shipped in from other points in Colorado, and from New Mexico, Utah, Oregon and Idaho. This lamb feeding industry, great as it now is, could be very greatly increased, and double the above mentioned number could be easily fed, so far as producing the necessary feed is concerned.

THE EASE OF FARMING. Lying in long, even, level slopes, the San Luis Valley is a remarkably easy country for farming. Irrigation ditches for the most part run on section and half-section lines. The fields being unbroken are easily handled by steam outfits, of which there are now more than twenty at work in the San Luis Valley. Plowing, harrowing and seeding sometimes at the rate of thirty-five acres a day, these plowing outfits get enormous areas in crop so that the spring moisture sprouts the seed without irrigation.

THE HOG INDUSTRY. Lambs do not quite clean up all the peas when they graze over a field, and from the beginning of the industry hogs have been introduced into the fields to glean them. It was supposed that the climate of the valley was not favorable for raising little pigs, so many carloads were annually shipped into the valley for feeding in the lamb lots. It soon appeared that hogs did even better on peas than the lambs. Then it was shown that all that was necessary to raise pigs was a little care and shelter, and it is now a proven fact that there is no part of the United States more favorable for pig production than the San Luis Valley.

A lamb, after eating all he wants, is inclined to take a little run for exercise, and thereby work into useless energy some of his stored fat. But the prudent hog, once he fills his stomach, finds a sheltered place and lies down to sleep until the peas have become fat and flesh, when he rises and eats some more. Because of this difference in inclinations, the pork value of an acre of peas is about 75 per cent greater than the lamb value.

The San Luis Valley hog is a healthy hog. The valley, with its endless sunshine, its cool air, its dry climate, its freedom from mud or miasma affords no resting place for disease germs. There is no hog cholera or swine plague known in the valley. Peas are rich in nitrogen, which makes rich, red blood and strong vital tissues. Pea-fed bacon has a firm, sweet streak of fat, and a rich, red streak of lean. Pea-fed pork is richer and jucier, firmer yet tenderer, better flavored and more nutritious than corn-fed pork.

Early in the season of 1906-07 one carload of San Luis Valley hogs, sent as an experiment, reached Los Angeles. The flavor and quality of the pork so pleased the fancy trade of that tourist metropolis that hurry orders for more cars went back to the valley, and in less than a single season that market alone took 110 carloads of live hogs from the San Luis Valley. The average price received by the San Luis Valley hog growers for their hogs, at home, was about 30 per cent above the top of the Chicago market on corresponding dates.

OTHER FARM PRODUCTS

Upon the field pea and attendant livestock interests rests a promising future for the San Luis Valley in many lines of general farming. The field pea possesses one remarkable quality—it fertilizes the ground in which it grows. Like other legumes the field pea draws nitrogen from the air and leaves it in its roots to enrich the soil for succeeding crops. Added to this is the manure from the livestock fed upon the peas, so that a San Luis Valley farm becomes each year richer and more productive.

The staple crops grown are wheat, oats, barley, field peas, potatoes, alfalfa, and native hay. Not very much alfalfa, comparatively, is grown, mainly because field peas—allowing a quicker rotation and being equal as a fertilizer and the hay being equally as valuable—are preferred to alfalfa.

Phenomenal crops of wheat, oats, barley and potatoes have been grown. Fifty to sixty-two bushels of wheat, 120 of oats, 75 of barley and over 400 of potatoes to the acre. But an average crop of each is about 30 bushels of wheat, 45 of oats and barley and 175 to 200 of potatoes.

The quality of the crops is excellent. Wherever San Luis Valley potatoes have been marketed people prefer them to any other. Oats seldom weigh less than 40 pounds to the bushel, and from that to 49 pounds. The wheat makes a choice biscuit flour, and a growing market for it is found in the South. There are seven flour mills in active operation in the valley, having a combined production of over 1,300 barrels of flour a day. Hundreds of carloads of native hay are annually shipped to the cities and mining towns of the state.

All sorts of garden and root crops and small fruits grow to perfection. Celery has a crispness and flavor seldom found in that grown elsewhere. Beets, turnips, rutabagas, cabbage, cauliflower attain a size and tenderness unusual.

The growing of sugar beets here has been tested thoroughly for many years, and it has been proven conclusively that the valley is well adapted to the growth of this crop. They have been shipped by the carload to sugar mills in Eastern Colorado, and tested 15 per cent to 16 per cent in sugar and 82 per cent and upward in purity.

The growing of peas, string beans, etc., for canning purposes is an industry which is likely to develop in the San Luis Valley before long, as these vegetables can be produced of the highest quality and in large quantities, at a small cost of labor.

Some of the hardier apples, crabapples, plums and pears bear well, but the San Luis Valley can hardly be called an orchard country. Small fruits, such as currants, strawberries and raspberries, yield crops of high quality.

ARTESIAN WELLS. The central portion of the San Luis Valley is a great artesian well basin, and there are thousands of such wells now flowing. The farmer, and especially the stockman, will particularly appreciate the advantage of having always at hand an abundant flow of pure water of even temperature, without trouble or cost for operation. These wells are sunk at small cost, and water is obtained at a depth of 65 to 500 feet.

CLIMATE. The peculiar situation of the San Luis Valley, enclosed and sheltered by the high mountain ranges, gives it practically a climate of its own. Winter storms generally leave the valley untouched. There are no blizzards. When snow falls it comes gently, and the protecting mountains intercept most storms, resulting in light snows in the valley. And what does fall does not lie on the ground long, and evaporates as it melts, leaving the ground dry. At night in winter the temperature may fall as low as 25 degrees below zero, but the days following the coldest nights are generally sunshiny and pleasant. It must be remembered that in a dry climate extremes of either heat or cold are not felt as they are in humid

climates. The springs are rather cool, comparatively, and subject to considerable windy weather in April and May. To compensate, the rest of the year is remarkably free from wind.

The climate of summer and fall is cool, invigorating, and as pleasant as can be found anywhere.

Social Conditions. Many people are living here in comparative good health, some rugged, whose physicians had given them up to die before they came here. It is especially beneficial to those with weak lungs.

The pioneer work has been done; canals and ditches built, towns, churches, schools and markets established. The present settlers are of the best class, intelligent, energetic, enterprising and probably 95 per cent American born. In short, the new settler will have nearly all the advantages of an old settled community, with the cheaper lands and most of the advantages of the new.

Lands, Towns and Railway Facilities. The San Luis Valley is traversed north, south, east and west by lines of the Denver and Rio Grande Railroad, which have outlets to the east, south and west, reaching all parts of the State of Colorado, the Gulf of Mexico and the Pacific Coast by short routes. The valley thus has all the advantages of its central position and reaches all markets at comparatively low railway rates.

The largest town is Monte Vista, with a population of more than 2,000, located in the west central part of the valley. Monte Vista is surrounded by the best and most highly developed part of the valley, the soil being the much desired gravelly or sandy loam. Land here sells at from $50 to $100 an acre.

Alamosa, in almost the center of the valley, is an important railroad town and junction. There is a large amount of land about Alamosa under irrigation from the Rio Grande, which sells at from $10 to $25 an acre.

Around La Jara, which is fifteen miles south of Alamosa, several large tracts, formerly held by cattle companies, are being subdivided for settlement. These lands, when irrigated, are very rich and productive. This section is watered mostly from La Jara and Alamosa rivers, two streams which rise in the Continental Divide west of the valley. On these creeks; reservoirs with an aggregate capacity of 50,000 acre-feet, are nearing completion, and water rights therefrom can be bought with land at from $40 an acre upward.

South of La Jara, at Romeo, is a large area of land almost exactly the same in character as that north of Monte Vista. This land is under irrigation from the Conejos River. Land here sells at from $35 to $70 an acre.

Antonito, at the southern end of the valley, is a junction point, one branch of the Denver and Rio Grande going from here west to Durango and the San Juan mining region, and another branch going south to Santa Fe, N. M., thus offering an outlet to the Pacific Coast.

The soil about Antonito is similar to that at Romeo. This section is being rapidly settled by stockmen.

Del Norte, at the extreme western end of the valley, is the oldest town in the valley. It is a well-built place, with shaded streets, city water works, fine school system, and is surrounded by valuable productive farms.

Around Fort Garland, at the eastern end of the valley, a co-operative plan is being developed, by which it is planned to build a reservoir of large capacity and bring an area of about 35,000 acres under cultivation.

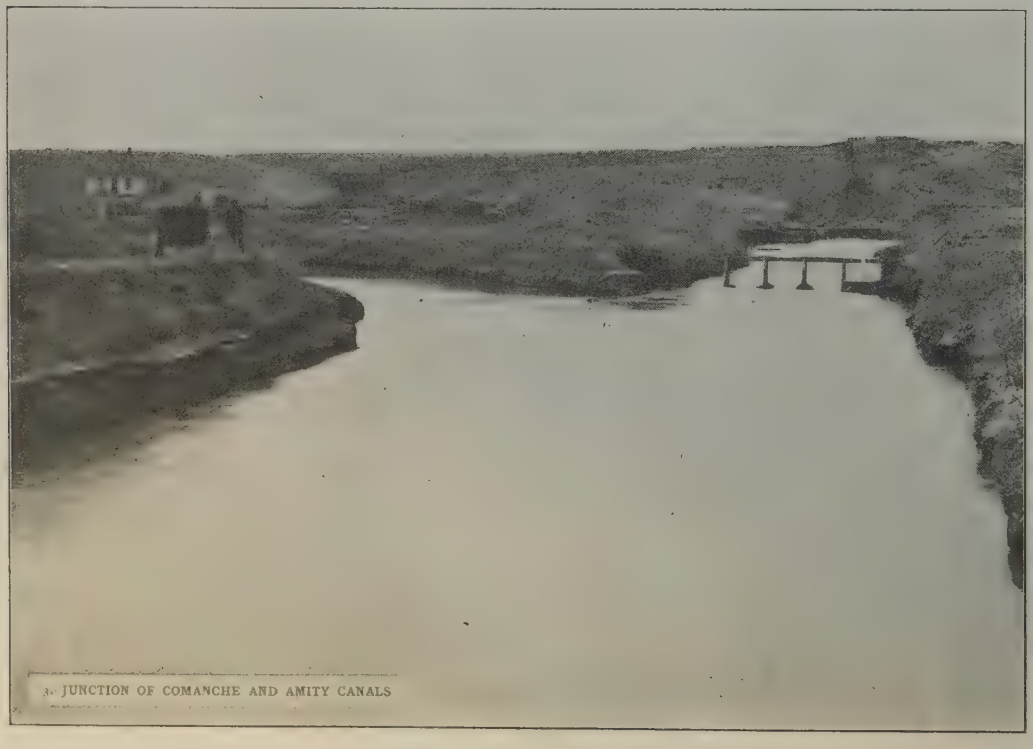
Straight north of Alamosa, on the narrow gauge line to Salida, are the settlements of Mosca and Hooper. This section of the valley enjoyed a great boom about twelve years ago, but careless methods of farming brought alkali to the surface and caused the abandonment of many farms. In the last few years, more careful farming methods have been practiced and fields which have lain idle for years are again being made productive. Land in this locality can be had at from $5 to $25 per acre.

Opportunity. The San Luis Valley offers exceptional opportunities to either the homeseeker or the investor. The lands in the valley are now selling for from one-third to one-half their actual intrinsic valuation if based upon an eight per cent net return. In most cases they are sold upon easy terms, so that a settler who can command the first payment and enough capital for a start can soon make his place pay for itself and become independently well off.

In the mountain valleys surrounding the San Luis are many fine reservoir sites, and the construction of these reservoirs will make fertile many thousands of acres of land now imperfectly watered or not watered at all. These reservoirs will make new opportunities for homeseekers and their construction will give remunerative employment to millions of dollars of capital.

In the central part of the San Luis Valley, where the soil is dense and the slope slighter than on the edges, the water applied in irrigation has failed to drain out naturally as fast as is necessary. The draining of this central area is both from a financial and an engineering standpoint not at all difficult, and this operation will restore to high productiveness a large area of land.

There are many canals from many streams in the San Luis Valley. There are water rights of all grades from very good to very poor. The soils vary. But everything is on the surface, and no one need fear to investigate. The best land is the highest in price, the most unproductive is the cheapest, but the highest priced is very cheap for its value.



JUNCTION OF COMANCHE AND AMITY CANALS

Marvelous Growth of The Grand Valley

By GEORGE R. CALDWELL

Grand Junction, Colo. (Special)—Grand Valley fruit lands, which twenty years ago were worth only the government price of $1.25 an acre are now selling as high as $4.000 an acre.

THE above fact in itself constitutes all that could be written in an endless volume, and it only remains to set down in glowing detail how this miracle has been wrought—by what magic such results have been recorded. The miracle is found in the natural constituents of the soil itself, while the magic is that of conquering climatic conditions happily combined with the fructifying favors of exhaustless irrigation waters—a unison which makes the streams of the Grand Valley veritable golden waters and annual floods of finance.

It is conservatively estimated that the first cost of the irrigated reclamation of the valley soil does not exceed 15 per cent of the primary orchard value secured—a percentage of irrigation cost which is steadily diminished as the orchards themselves attain bearing maturity—a fact which eventually results in not only the entire wiping out of irrigation cost, but the transformation of the original irrigating charge into an actual orchard asset and source of annual revenue.

With fruit lands with a perpetual water right starting at a purchase price of $250 an acre, and advancing in market value from year to year to $500, $1,000, $2,000, $2,500 and $4,000 an acre, it can be readily seen that the original and permanent irrigation charge speedily resolves itself into a practically paying investment.

NATURE GENEROUS IN THE GRAND VALLEY. The Grand Valley—also called 'The Gem of the Western Slope"—lies entirely in Mesa County and comprises an area about 40 miles long with a maximum width of ten miles, the county deriving its name from the broad and fertile mesas rising above the current of the truly Grand River, while the beautiful and prosperous county seat owes its christening of Grand Junction to its situation at the confluence of the Grand and Gunnison Rivers.

The valley soils are almost wholly comprised of materials derived from sedimentary rock formations, the only exception being the alluvial deposits along the Grand River itself.

Generous old Mother Nature has beneficiently divided these soils into distinct and separate belts, each of which is especially adapted to its own particular and prolific variety of harvest return.

The Laurel fine sand has a soil depth ranging from one to six feet and is especially and profitably given to market garden culture.

The Laurel sandy loam is from two to six feet deep and produces large returns in the berries and smaller fruits, sugar beets and alfalfa, while heavy truck crops are also secured.

FRUIT BELT RICH IN FERTILE SOIL. The Billings fine sandy loam has a depth of six or more feet, and constitutes the great fruit belt of the valley, growing nearly all the orchards of the superb Palisade peach region. This soil also yields heavy crops of sugar beets and alfalfa. The western portion of this great soil belt has many excellent apple orchards, both stone and seed fruits being of such prolific bearing that it is usually necessary to sacrifice a portion of the product during its earlier growth stages, in order to enable the trees to bear the big burden of fruit maturity. Alfalfa yields on the Billings fine sandy loam comprise three crops a year, with an agregate of from four to six tons an acre. Sugar beets run to 15 tons an acre, while potatoes, market garden vegetables, corn and berries all do well.

The Billings clay loam is naturally designed for the growing of apples, pears, wheat, oats and corn, with alfalfa and sugar beets in generous return.

The Billings silt loam is from three to six feet in depth and produces good crops of alfalfa, pears and sugar beets. This is an alluvial soil, and its harvest values are being annually added to by an active and intelligent seepage drainage.

FINEST ORCHARDS ON MESA SANDY LOAM. The Mesa sandy loam is light and friable; ranges in soil depth from six to twenty feet, and supports some of the finest orchards in the valley. But a small area of this soil is yet in cultivation, but it has already demonstrated, in addition to its great orchard values, splendid capacities for alfalfa and market garden croppage, a United States Government expert saying that "the Mesa" sandy loam is pre-eminently adapted to fruit and tilled crops."

Mesa clay loam is from four to six feet deep, is rich and productive, and especially adapted to alfalfa, sugar beets and grain. This soil is chiefly found on Orchard Mesa, near Grand Junction, and is practically free from alkali.

Fruita sandy loam is six or more feet in depth, is friable and readily cultivated, rarely proving refractory to tillage. This soil principally composes the wide and wealthy fruit areas immediately surrounding the Town of Fruita. Some of the finest apple and pear orchards of the valley are upon this soil type, while sugar beets, alfalfa, wheat and oats are all large growths of the fertile Fruita fine sandy loam.

The Fruita loam, a soil separate and distinct from the Fruita fine sandy loam, is at present a good grower of sugar beets and grain, and, with more drainage, will develop into fine fruit lands.

There is practically no hard-pan in the soil area of the Grand Valley, while irrigation is the sworn and successful foe of alkali deposits.

MONEY VS. MORTGAGE IN ORCHARD LAND. The farmers of the Grand Valley are, as a rule, in a remarkably prosperous condition.

View of Main Street, Grand Junction, Colorado, Looking West

Such a thing as a mortgage foreclosure is almost unheard of, while the field, the orchard and the garden vie with each other in harvest production and money making markets.

Peach trees begin commercial bearing at three years old, and attain full production at seven or eight years of age, the fruit netting the grower from $400 to $800 an acre. The great Elberta, frequently attaining a weight of over a pound each, is the pride of the valley peach orchards, while the early and late Crawfords; the Carman and the Arp Beauty are all superb commercial varieties.

The apple orchards chiefly count the great commercial varieties of the Ben Davis, the Gano, the Jonathan, the Winesap and the Minkler.

Cherries, apricots, nectarines, prunes and quinces are also grown with marked success in the Grand Valley, while all the berries flourish in profusion and profit.

Within the last three years, counting the present season, about two million new fruit trees have been set out in the Grand Valley.

Grand Valley fruits have an alike national popularity and market scope, their marketing being facilitated by the traversing of the valley by the Denver and Rio Grande and Colorado Midland Railroads, the Midland running over the Rio Grande tracks, while a Denver and Rio Grande line runs from Grand Junction across the mountains to Ouray and the San Juan district, and through Montrose, Delta and other towns, and over other mountains to Gunnison, traversing the Gunnison country and connecting at Salida again with the main Rio Grande rails.

Organization Has Enlarged Markets. The recent organization of active fruit associations and co-operative marketing concerns has resulted in the shipping of Grand Valley fruits to far distant markets, the chief peach markets now being Missouri River cities and towns, while peaches have been shipped to Boston with gratifying results.

Apples are largely sold within the state, with an extended and lucrative Western shipping market, principally to Southern California points.

The now constant growing sugar beet industry is proving a new and great Grand Valley boon, as it brings into active and prosperous cultivation those lands not so well suited for fruit or other general farm culture, and also establishes a new and heavy wage and sale schedule.

The smaller fruits and vegetables meet with a ready and profitable sale to the mining districts and various cities and towns of the state.

Alfalfa, with its production of from four to six tons an acre, and selling price from $8 to $15 a ton, is nearly all consumed in the valley, the fruit growers furnishing a ready alfalfa home market.

Phenomenal Yields of Grain and "Spuds". The grain and potatoes are of profitable sale, wheat reaching as high as 60 bushels an acre and oats climbing to 125 bushels, while potatoes "dig up" money for yields of 300 and 400 bushels an acre.

Market garden vegetables and corn or potatoes are often planted between the rows of young fruit orchards, with the double good result of a thorough irrigation of the trees themselves and the securing of paying crops from the land during the unproductive first years of orchard growth.

Raw valley land is readily and cheaply cleared of its natural growth of sage brush, a riding plow in nearly all locations being capable of at once breaking and clearing the land.

High Line Canal Will Reclaim Vast Acreage. The late visit to Grand Junction of high officials connected with the Grand Valley United States Government High Line Canal brought with it the welcome assurance of the commencement of actual canal construction by the first of next January.

It is estimated that the canal will be completed within twelve months from the commencement of construction, will cost an approximation of $2,000,000, and, through the fruit and general farming cultivation of the 70,000 acres covered, will advance the Grand Valley to premier rank in Colorado tillage and insure to Grand Junction a population of 30,000 within the next six years, thus inseparably and imperishably interweaving the names of Garfield, the Grand Valley and Grand Junction in a great sign manual of progress, prosperity and population.

Fruit Harvest Worth Two Million Dollars. Last year's fruit harvest brought $2,000,000 to Grand Junction and the Grand Valley. Last year frost killed practically the fruit of all sections of the Nation, but the orchards of the Grand Valley well filled the deficit.

Last year H. O. Kiser sold $6,000 worth of apples from five acres; A. J. Harvey marketed $2,750 worth of pears from one and one-quarter acres; M. F. Yeaton banked $4,000 from four acres of pears; Robert Orr averaged a sale of $2,000 per orchard acre; one apple tree produced 47 boxes selling for $60; one apple acre produced $1,700 worth of fruit; a cherry tree has averaged for several years past $30 per year; ten acres of peaches six years old have returned an aggregate receipt of over $10,000; two-thirds of an acre of peaches brought $940; common returns in peach culture count from $400 to $800 per acre.

Spraying a Peach Orchard Under Irrigation in the Grand Valley, Colorado

Poultry Profits in the Grand Valley Great. Poultry breeding is very profitable in the Grand Valley. The poultry farm of Charles A. Smith, near Grand Junction, counts 1,500 of ordinary and fancy bred chickens, and a large number of homing pigeons from which $700 worth of squabs are marketed each season, while 1,000 dozen eggs are sold every year from the hennery. Fancy bird eggs for hatching purposes bring $2.25 per setting, about $400 per season being realized from this source, the breeding cocks costing as high as $40 each, with hens worth from $5 to $15. Mr. Smith's total investment is about $2,500.

Irrigation Supply of Valley Exhaustless. The irrigation water supply of the Grand Valley chiefly comes from the Grand River and includes the application of both the gravity pressure canal and the water lifting pumping plant driven by water power itself, this irrigation water supply always, doubtless, being greater than can be used by the valley.

The Grand Valley canal has a total length, including the Kieffer extension, of 46 miles, and has an irrigating capacity of 50,000 acres, with a present covering of 40,000 acres and an actual cultivation of 30,000 acres, which is being added to at a rate of 3,000 acres per year, the present water distributing length of the canal system being over 100 miles.

The stock of this canal is all owned and issued by the farmers themselves, the combined cost of irrigation itself and canal maintenance averaging but 65 cents an acre, an annual cheap irrigating canal cost which confidently alike challenges comparison and competition.

The Grand Valley has 150,000 acres of easily irrigable land, of which 85,000 acres are now provided for by canals and already operated or project pumpage plants, while the coming big United States Government High Line Canal will irrigate the remaining 65,000 acres.

The great pumpage plant of the Red Lands Irrigation & Power Company is alike the most powerful and perfect of its character yet known to the West.

This plant will irrigate 5,000 acres of land on the rich Red Lands Mesa across the Grand River from Grand Junction, and will also generate electric power for extended commercial purposes, including the furnishing of electric motors for various coming Grand Junction industrial enterprises and the city's projected street car trolley system. The total cost of this plant and general irrigation system to date has been in excess of $200,000, of which $50,000 has been expended on machinery and comprises two 600 horse-power pumps and two 600 horse-power electric generators. The pumpage has a present lift of 180 feet and can discharge a combined flow of 24,000 gallons of water per minute, which is equivalent to 2,000 irrigating water inches. Only one of the pumps, however, is now in operation, as its water discharge is sufficient for present irrigating need.

Power Plant Could Supply Large City. The power canal is four miles long, 27 feet on the bottom, 44 feet on top, and ten feet deep, while the distributing canal is 15 miles long.

At least 600 electric horse-power can be generated for commercial sale, while the company will establish an additional pumpage irrigation plant farther down the river which will be electrically driven and have a water lift of 125 feet. It is estimated that this plant can generate sufficient electricity to fully supply all lighting or industrial power need of a city of 25,000 people, and also operate 50 miles of trolley railroad. The running expense of the plant itself does not exceed $175 per month.

This year will see 1,500 acres of the rich Red Lands mesa irrigated by this pumpage plant, while the entire 5,000 acres will be irrigation served within the next two years.

The Red Lands Mesa is practically free from frost visitation, the Kieffer brothers' orchard, for instance, located at the head of the mesa, being in alike blissful and bountiful ignorance of even the word frost.

Irrigation District for Orchard Mesa. An irrigation district has been organized under state law to cover 12,000 acres on the fertile Orchard Mesa on the south side of the Grand River and opposite Grand Junction.

These lands are to be irrigated by a pumpage power plant similar to that of the Red Lands Mesa, it being expected that 6,000 acres will be receiving irrigation water within the next two years.

Orchard Mesa is one of the choicest of the many choice fruit and farm areas of the Grand Valley. On this mesa a water lift pumpage has been successfully irrigating 1,000 acres of land for many years.

The successful operation of a pumpage water lifting plant renders available to the irrigation the raggedest and most broken lands lying along the Grand Valley streams or canals. Every barren butte will be crowned with the burdened orchard bough, every haggard hill will hold the halo of heavy horticultural harvest, and every gashed gulch and gulley will be glorious with overhanging fruitage. Even the waste places shall be those of wealth and roughness shall be riches.

The Smudge Pot Slays Jack Frost. The kindly climate and high land elevations naturally antagonize frost in the Grand Valley, and even the rare frost visitations are now in a fair way to be entirely prevented by the introduction of the "smudge pot" with a burning of oil or coal and a use of from 40 to 80 pots an acre. By the way, the name of "smudge pot" in this connection is a misnomer, as it is evidently the heat from the pots instead of the smudge or smoke which routs the frost fiend.

The various Grand Valley chambers of commerce, boards of trade and fruit associations have intelligently and energetically taken up this matter of frost prevention and next spring will see three-quarters of a million coal or oil heated smudge pots in operative burning in the Grand Valley, with the undoubted result of a final "good-bye" to spring orchard frosts and the henceforth annual insurance of full maturing of the naturally magnificent valley fruit harvest.

Grand Valley farms are nearly all of home holding, being actually owned by the farmers themselves, the farms ranging from five to 160 acres. In fact, the only large proprietary areas in the

Sugar Beet Field and Orchards Under Irrigation in the Grand Valley

Home Ranch, Verner Z. Reed's Fruit Farm, at Loma, 18 Miles West of Grand Junction. Total Acreage Nearly 3,000. 30,000 Apple Trees Planted During Spring of 1908. Buildings Shown are the Barn, Superintendent's Residence on Extreme Right, Office Building, Granary, Ice House, Machine Sheds, Blacksmith Shop, Boarding House and Bunk House.

valley are those of thousands of acres of the Western Land & Sugar Company and the 3,000 acres owned by the Reed Investment Company in the Loma section.

A generous yearly harvest labor market is furnished by the Grand Valley, the hired workers being generally robust and intelligent young men, many of whom promptly graduate into prosperous home holders themselves.

GRAND JUNCTION BEET SUGAR PRODUCTION. The Western Sugar and Land Company is cropping this year 6,000 acres of sugar beets, which will average 14 tons an acre, with a saccharine showing of 15½ per cent per ton. This means a cutting by the sugar factory this year of 75,000 tons of beets and a sugar production of 200,000 bags of sugar of 100 pounds each. The company will distribute in cash this year over $400,000 to the farmers for sugar beets and will pay out more than $300,000 for labor.

Last year the company cut 63,000 tons of beets as against the 75,000 tons to be cut this year. To provide for this additional business, the company is making an improvement in its plant amounting to $100,000, the added expenditure including the purchase of new boilers, new crystalizers and new centrifugal machinery.

General Manager Davie has just completed a tour of all the beet territory subject to cultivation by the Western Sugar and Land Company and says that the outlook was never better and could not probably be improved.

Manager Davie says further that a $500,000 sugar factory will be erected year after next at some point in the Uncompahgre Valley, the location of the factory not yet being finally decided upon.

THE METROPOLIS OF THE WESTERN SLOPE. Grand Junction, the seat of Mesa County, is the center as well as the capital of magnificent Mesa County. It is the metropolis of the western slope and is the coming city between Denver, Colorado Springs and Pueblo on the east and Salt Lake City on the west, and is already the practical commercial distributing point of Western Colorado and Eastern Utah.

It has at present a population of 10,000 and is rapidly putting on newer and greater civic garments. It is a center of modern civilization as well as munificent commerce, having a superb system of public schools, commodious and well supported churches and all of the residence and building block improvements of the day and the time, a further evidence of these facts being the present construction of a $60,000 Y. M. C. A. Building. James A. Garfield, Secretary of the Interior, said:

"At Grand Junction I saw a wonderful country. That part of Colorado is as near perfect as nature and the hand of man can make it."

Secretary Garfield might have added that while nature had made a wonderful country of the Grand Valley, modern man was making just as wonderful a city called Grand Junction.

PEACH CULTURE AT PALISADES. Palisades and peaches are two words largely and luxuriantly interwoven in the great Grand Valley production of this great fruit. The Palisades are sheer and serial cliffs which lift themselves from 1,000 to 1,500 feet above the flow of the Grand River, the fertile peach lands lying along the cliff bases.

Palisades peach culture includes two great cardinal facts: First, the natural soil adaptability to peach growth; and, second, the at once sheltering and further fructifying harvest action of the Palisades themselves.

From the broad and lofty face surface of the Palisade cliffs, an alike warm and wise sun reflects its powerful and timely rays upon the Palisade orchard areas, thus uniting with the rich soil for the final production of the perfect Palisade peach. This exceptional and fortunate natural union of soil and sun is yet further improved by the intelligent practice of Palisades peach growers of annually thinning out and opening to the sun rays the topmost foliage of the peach trees themselves and thus allowing the utmost free action of the sun in the rapid ripening and conquering commercial coloring of the fruit itself.

What is known as the Palisades fruit region comprises 10,000 acres covered by two irrigation district water power pumping plants, with respective irrigation water lifts of 35 and 82½ feet, and an aggregte total pumpage and canal construction cost of $250,000.

GREATEST ORCHARD VALUES IN THE WORLD. Immediately tributary to the town of Palisade are 2,500 acres of peach orchards which are valued from $1,000 to $4,000 per acre, with a conservatively estimated average market worth of $1,500 per acre—thus contributing, in comparative acreage values, the heaviest priced compact body of agricultural land yet known in the world.

H. G. Crissey has lately sold to F. E. Swisher six acres of 4-year-old peach trees for $24,000, or $4,000 per acre. Dr. Devine has a 60-acre peach orchard which can be readily sold at $2,000 per acre, while suburban lots 125x25 feet, set out in peach trees, are commanding purchase offers of upward of $1,600 each.

PALISADE'S PROTECTION FROM FROST RAVAGES. Owing to the already noted warm reflection of the sun from the Palisades cliffs, the Palisades region is frost protected, this season's orchard crop being even fuller and heavier than usual and requiring industrious picking off of surplus green fruit to prevent the trees from breaking down beneath their harvest burdens.

W. A. Reed gathers from $700 to $800 per acre per year from his peach orchard; two acres of cherries in the Bancroft orchard yearly return an average of $1,000 net per acre, these Palisades cherries all going to Denver for especial Capitol Hill table consumption. The Bowman apple trees produced last year a maximum yield of 2,300 boxes per acre at $2 per box, or $2,600 per acre; the same orchard, also, producing 2,650 boxes of peaches to a particular one acre, with a general average peach yield per year of 1,000 boxes per year, or from $750 to $1,000 per acre; J. E. Morford banked $8,000 from an eight-acre orchard last year; W. J. Moreland has realized $1,510 per acre in pear harvest, and Jerome Eyer marketed from four and a half acres of peaches nearly $4,000, or an average approximating $900 per acre. Mr. Eyer's Elberta peaches netting $1.48 per box.

Palisades has three active fruit growers' associations, one of which, the Peach Growers' Association, is the only actual home fruit packing concern in the state. This association has installed this year automatic fruit graders which are alike labor and time saving and enhance general shipping market revenues.

Palisade's Progress and Population. Palisades has a present population of 1,000 and is steadily adding to her civic growth and development, new buildings to be constructed this year including a $40,000 business block by the Palisades National Bank; a similar block by J. W. Hugus & Co.; and $25,000 church buildings by respectively, the Baptist and Campbellites.

W. J. Sanborn, a prominent Palisades fruit grower, has solved the problem of local peach grafting, successfully growing this year new wood on old stems. The grafting process means the having of two years' growth of peach trees in reaching bearing maturity, and is worth dollars counted by the hundreds of thousands and the millions alike to the Palisades region, the Grand Valley and the peach interests of the state at large. Grapes have heretofore been a profitable Palisades crop, but are now being pulled up and replaced by the princely and more paying peach.

In the Palisades region, as elsewhere in the great Grand Valley, is the greatest climatic and commercial peach.

Farming in the Vicinity of Fruita. The Fruita region of the Grand Valley is a general and generous horn of agricultural plenty, ever filled to overflowing with varied and valuable harvests.

Here grows in equal and exhaustless profusion the apple and the apricot, the pear, the peach and the plum, the grains and the grasses, the potato and the market vegetables. Fruita apple orchards range in extent from 10 to 80 acres, and are famous alike in quantity and quality of fruit.

The grains are of heavy harvest while the extensive and luxuriant alfalfa crops are sold throughout the other portions of the Grand Valley at from $8 to $10 per tons, a Fruita alfalfa acre annually netting from $30 to $50 per acre.

Land values in the Fruita region have more than doubled within the past 18 months, and will add a new 50 per cent to their prices by the first of next year.

Twenty acres of apple orchard were lately sold for $675 per acre, while a year ago last spring a 42-acre grain and hay farm was purchased for $3,700, a $2,000 crop harvested last year, and the farm itself resold this spring for $5,700, an orchard cash clearing by the first purchaser of at least $3,000 from 42 acres of Fruita land in one year's time.

Fruita Strawberry Superb Specialty. While all the berries grow to perfection around Fruita, the strawberry is a superb specialty, alike as to the produced quantity and quality and the market prices realized.

Fertile Fruita soil and favorable climatic conditions produce two marketable strawberry crops per year, the last crop being generally marketed in the latter part of September and during October with the realization of fancy shipping prices. Last year a Fruita strawberry grower cultivating one and one-half acres, sold his two crops for an aggregate of over $900—or about $750 an acre. Frost caught Fruita strawberries to some extent and yet one strawberry grower reports that he will realize this year at least $250 worth of the berries from one-half acre of ground.

The new Government High Line Grand Valley Canal will be of signal benefit to Fruita, largely increasing her present surrounding irrigated land acreage and adding heavily to her tributary agricultural population and commercial patronage. The city is supplied with pure mountain water, piped a distance of 24 miles, the system costing $85,000.

Adds the Bountiful Bean to Her Products. Within the past two years Fruita has added the bountiful bean to her already long list of harvest products. Fruita beans are now being grown in tracts ranging from one to six acres, and include the American white navy and the black Mexican varieties, there now being over 100 acres of beans grown in the Fruita vicinity. The beans net $100 per acre and the next two years will see a shipment to general outside markets of the produce of at least 1,000 acres of Fruita beans, with a yearly local revenue approximating $100,000.

Fruita is a modern, up-to-date municipality, here present civic improvements including a fine water system and city sewerage.

Lands Rapidly Being Planted to Orchards. These lands are being rapidly put into orchard, grain and hay production, 305 acres being already in apple orchards, while this year's farm planting counts 300 acres in alfalfa, 200 acres in oats, 150 acres in sugar beets, 40 acres in potatoes and 10 acres in general market garden vegetables.

Next year will see the additional setting out of 300 acres of apples, cherries, plums and pears, this fruit planting to be annually continued until the Reed orchards in the Loma district cover 1,000 or 1,200 acres, Mr. Reed's intention being the establishment and commercial operation of the largest individual orchard area in the state, with apples as a particular and preferred orchard product.

The home station and official headquarters of the Reed farms have been expensively and elaborately equipped, $18,000 being expended in the construction of residence, office and general buildings, the equipment including a water system with pipeage into the various buildings and an ample fire protection service. The Reed farms now employ 50 farm laborers at a wage of $50 per month, thus creating a payroll for manual labor alone of $2,500 per month.

Loma, the Region of Productive Loam. The Loma region, so named on account of the rich and productive loam of which its soil is composed, is located in the western portion of Mesa County and draws abundant irrigation waters from the Keiffer extension of the Grand Valley Canal.

In this district are now being developed the 3,000 acre holdings of Mr. Verner E. Reed of the Reed Investment Company of Colorado Springs.

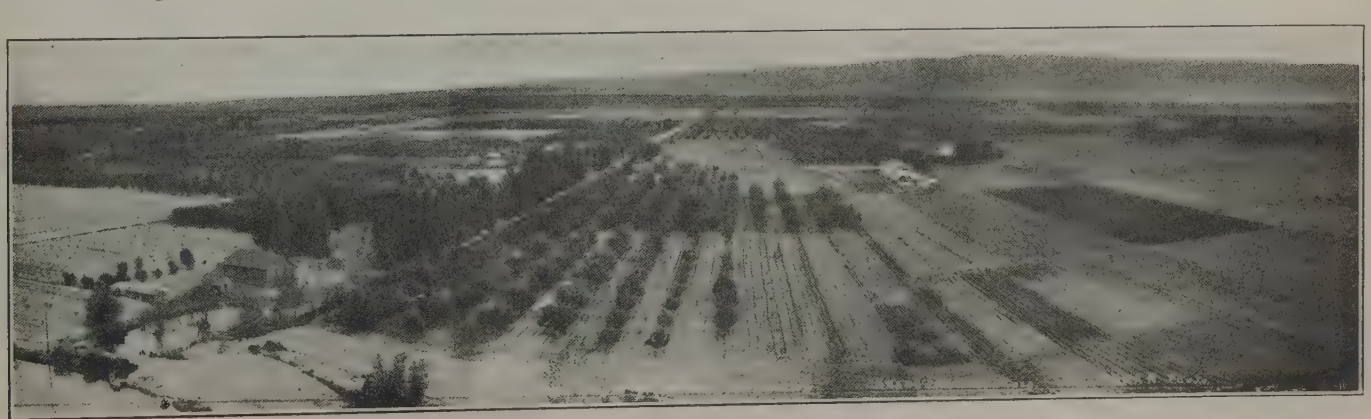
Varied Resources Found at De Beque. De Beque, the most eastern of the towns of the Grand Valley, has perhaps the most varied resources of any section of this great valley.

De Beque is surrounded by 10,000 acres of superb, but yet undeveloped, fruit land and within this great coming orchard radius are located immense coal, natural gas, brick and potter's clay and cement fields.

Touch De Beque with the wand of capital and investment and you develop resources by the dozen, each and every one of which will help and support the other.

The Fruit Belt and Power Company, composed of Colorado Springs, Grand Junction and other Colorado capitalists, is locating at De Beque an immense water power plant for the generation of electricity to be used for general irrigation, manufacturing and trolley railroad purposes in the Grand Valley.

The water power concerned will have a capacity for the eventual electric generation of 150,000 horse-power—the company having one and one-half millions of dollars back of it.



Scene from Mantey Heights, Near Grand Junction, Colorado, Showing Orchards Under Irrigation

Prevention More Than Penalty

By WILLIAM JENNINGS BRYAN

PRESIDENT ROOSEVELT deserves credit for having focused public attention upon unearned wealth. Others have striven to awaken the people to the menace of the vast accumulations which have been gathered together by questionable, if not by immoral, methods, but it has required a louder note than the unofficial were able to sound to reach the ears of the multitude.

The phrase "swollen fortunes" is a happy one, for "swollen" means something unnatural or abnormal, and suggests disease. No objection is raised to natural fortunes; normal wealth is healthy and wholesome. There is every reason to encourage the amassing of money by legitimate means; those who grow rich in honest ways are to be commended rather than censured, but it is high time that it should be known that there are unearned fortunes, for until the fact of their existence is known no inquiry will be made into the source of such fortunes; and until the source is known no remedy can be applied.

In order to distinguish the swollen fortunes from the natural ones we must adopt some rule or standard. How may a man honestly accumulate a fortune? By giving to society a service commensurate with the reward which he draws from society. It is not possible to define with mathematical accuracy just how much a man's services are worth, for there is no tribunal which is vested with power to weigh the facts and determine the question. And if the question were submitted to any human tribunal it is not at all certain that the decision would be in accord with justice, for often the greatest services are not appreciated at the time. By common consent it has been left to society at large to determine what a man shall receive for his work, and competition is the word which we use to describe the methods by which the value is fixed. As long as competition is left free each person receives from society the price which society fixes upon his work, as compared with the work of others. This rule, that each should draw from society in proportion as he contributes to the welfare of society, is in harmony with the divine law of rewards, insofar as that law can be gathered from nature. When God gave us the earth with its fertile soil, the sunshine with its warmth and the showers with their moisture, He proclaimed as clearly as if His voice had thundered from the clouds, "Go, work, and in proportion to your industry and your intelligence, so shall be your reward."

The earth yields her treasures to those who labor, and she rewards intelligent labor more liberally than ignorant labor. Two men, living side by side, may cultivate farms of equal area and fertility, and yet one grows rich while the other grows poor. If they are equally intelligent the more industrious one will surpass the less industrious; if they are equally industrious the more intelligent one will forge ahead. Industry and intelligence are both necessary; either is fruitless without the other. (We are not speaking now of economy in the expenditure of the income, or of the use made of the money earned; we shall refer to this later.) Other things being equal, the farmer who puts the most intelligence into his work will secure the best results. He will examine the soil, so as to plant the crops to which the soil is suited; he will be careful to select the best seed, so as to secure the maximum yield; he will investigate the different kinds of cultivation and ascertain the best time for planting; he will use the implements which will make each hour's work accomplish most. That he is entitled to the rewards that naturally follow his work is universally recognized; and, we may add, no one has ever traced a swollen fortune to a farm. From the beginning of history no one has actually made out of the soil by his own unaided efforts, a fortune large enough to be, in itself, a menace to his country. A man might make money enough in some other way to buy up the land of a community or of a state, and, through a system of landlordism, he might sap the life out of the producers of wealth, but he could not begin by the cultivation of the lands—as large a piece as he could himself cultivate—and out of the land accumulate enough to make himself dangerous to his fellows.

It is possible for a man to make money out of the rise in land, and yet do it legitimately. Our government has seen fit to offer inducements for the settlement of new land. We have had the homestead act, the desert act, the timber claim act, and later entries under the Carey act and the reclamation act, which enable pioneers to secure land by contributing their pro rata to the cost of bringing the land under irrigation.

The purpose of these acts is to offer a reward to those who open up new settlements and extend the cultivated area. These acts offer a bonus for early settlement, and the results have justified the laws.

We have recently had an opportunity to observe the development of a large district by one man—a development which has brought him a pecuniary reward, and yet a reward well earned. Twenty-eight years ago, when but eighteen years of age, this man was riding along the north bank of the Snake River in Southern Idaho, when he chanced to see in a canyon below him two transparent lakes. His curiosity was excited, and, tying his horse, he attempted to descend, but found the canyon wall too precipitous, for here the river is five hundred feet below the level of the desert, and the lakes are some two hundred and fifty feet above the river. He went along the bank until he found a place where he could descend to the river, and then he climbed up to the lakes. He found that they were fed by springs, and that the stream flowing out of the lakes disappeared into the ground. A hundred and fifty feet below the lakes he found a spring with a flow sufficient to irrigate eight thousand acres of land. Boy though he was, he saw the possibilities of the place, and located there. At this point the walls of the river recede, leaving something like a section of land that can be cultivated. He began to dig ditches, and, as time went on, orchard after orchard was planted, many of the trees growing among the rocks. Vineyards and alfalfa fields followed. The lumber for his house was let down into the canyon by ropes. In a few years he built a road up one wall of the canyon, later established a ferry, and built a road up the opposite wall. At first he had to haul his produce fifty miles, then twenty-five miles; now, the railroad is within three miles of his ranch. When his income became sufficient he married, and his wife has been his co-laborer. For years they lived far from their nearest neighbors, and developed this sheltered nook which he had found by the river.

In the course of time he began to wonder if the water of the Snake river might not be utilized for the reclamation of the desert about him. He surveyed the river banks, carrying the chain himself, to ascertain the levels. He estimated that five thousand acres of land could be brought under irrigation in his immediate neighborhood. He selected the site for a dam, and then went out in search of capital to develop the plan. At first, people were skeptical, and he had difficulty in convincing the financiers that the scheme was feasible. At last his perseverance was crowned with success, and within the last three years he has seen 170,000 acres of arid desert on the south side made to blossom like the rose. Where three years ago sage brush was the only vegetation there are now alfalfa fields yielding eighty bushels to the acre. Towns have sprung up on this tract—one with a population of two thousand people, with banks carrying deposits of $500,000.

On the north side of the river his plans are now being worked out; canals are being dug for 150,000 acres more, and he has surveyed for still other ditches. Within three years ten thousand people will find homes on the newly opened territory. Here is wealth creation; intelligence and industry combined have drawn wealth from the generous breast of Mother Earth, and no one will begrudge him the fortune—not large when measured by the standards of great cities, but enough for him—which he has earned by the development of the land along the Snake River. This illustrates how wealth can be created by irrigation. Others have made fortunes in the improvement of horses, of cattle, of sheep and of hogs; and still others by the improvement of grains, grasses or fruits.

ARIZONA

The Salt River Valley and Its Advantages

THE Salt River Valley, which is situated in Maricopa County, Arizona, offers special inducements to the farmer, the investor and the homeseeker; and the object of this publication is to call the attention of those who are seeking investments and homes to the rare opportunities offered here. This valley comprises about a half million acres of very fertile land. The climate is mild, dry, free from snow, ice, cold winds and violent storms. No cyclones, sunstrokes or frostbites. Of this half million acres, there are about 125,000 acres in cultivation.

Owing to the scarcity of rain, all of the lands of the Salt River Valley must be irrigated in order to produce crops, dams are built across the river, and the water is conducted to the land through canals, ditches and laterals. When the water is applied to the lands vegetation immediately springs forth. It is difficult to make an outsider believe that for only a month or two vegetation is at a standstill, and that from four to six hay crops can be harvested during the season. Yet this is true.

Much difficulty has been experienced by the flood waters of our rivers going to waste at a time when they were not much needed, and when needed there was not enough to supply the demand.

This difficulty will soon be overcome by impounding the flood waters by means of great dams and reservoirs. The United States Congress, in passing the National Irrigation Law, put in force one of the wisest acts of recent years. This law will cause many a desert waste to be reclaimed. Happy homes will spring forth and millions of people will live and prosper where once there was nothing of value to mankind.

The people of the Salt River Valley were in position to take immediate advantage of the Reclamation Act. Preliminary investigations showed the possibility of water storage on Salt River in Tonto Basin. This project, which is known as the "Salt River Project," was one of the first undertaken by the United States Reclamation Service, and is now being vigorously prosecuted to completion for the purpose of supplying the lands now under cultivation with a steady flow of water, and reclaiming from the desert other lands which heretofore were without water.

THE TONTO DAM AND RESERVOIR. The Tonto Dam and Reservoir, as they are known locally, from their location just below the junction of Tonto Creek with Salt River, though under the Reclamation Service are called the Roosevelt Dam and Reservoir, will give a continuous supply of water for about 200,000 acres of land. This dam is seventy miles from Phoenix, but the land to be irrigated from it lies within a radius of 20 miles around the city—the Salt River Valley. The dam is reached by a fine wagon road, just like a boulevard, from Mesa City, built through magnificent mountain scenery, at a cost of about $100,000, $75,000 of which was contributed by Phoenix, Tempe and Mesa.

This dam is being built of huge blocks of stone laid in cement in the most permanent of masonry construction. Tonto dam will tower 280 feet above the foundation on bed rock thirty feet below low water mark. This means 250 feet of structure above the surface. At each end of the dam, overflows or spillways will be cut in the solid rock of the canyon sides. These spillways will be 200 feet wide, 20 feet deep, and over each will be built a concrete bridge connecting with the top of the dam, and forming a continuous wagon road over the dam. Water will be let out of the reservoir through a 500 foot tunnel, cut through the solid rock around one end of the dam. Stretching behind the dam will be the largest artificial body of water in the world, a lake 25 miles long, with an average width of one and a half miles, and a capacity of 1,300,000 acre-feet. This means water sufficient to cover 1,300,000 acres one foot deep. The cost of construction will be $3,850,000.

It is not expected that the whole supply of the reservoir shall be used in any one year. While at present it takes about four acre-feet of water to thoroughly irrigate crops through the year, over half of this supply is received from the natural flow of the river. At this rate, the reservoir, when once filled, would suffice for about 3 years' supply if no more water should be added to it in that time from natural sources.

During the early months of 1905, careful figuring shows that enough water ran down the river and went to waste to fill the reservoir three times. The same has been the case during the winters and springs of 1906 and 1907.

GRANITE REEF—DIVERSION DAM. For thirty miles or more

Baptist Church **First M. E. Church**

Strawberries, Near Phoenix
Oats 8½ Feet High
Sugar-Beet Factory, 8 Miles Northwest of Phoenix

below the Roosevelt Dam, Salt River flows through a precipitous box canyon, and this natural water-way will be the outlet for the reservoir. At the mouth of this canyon, and below the junction of the Salt and Verde Rivers, the U. S. Government is constructing a permanent diversion dam at Granite Reef, 28 miles up the river from Phoenix. This dam, which will rest on rock foundation, will be built of stone and cement, and when completed, will withstand the floods, which heretofore have carried away the temporary dams, sometimes once or twice a year. This dam is not intended to impound water, but simply to divert the water from the river into canals. The dam, when completed, will divert the water of the river into two large distributing canals, one on the north side, and the other on the south side, of the river. These canals will carry water down the valley to the smaller canals, ditches and laterals, to the lands to be irrigated.

Development of Power. The U. S. Engineers of the Reclamation Service, in carrying out the plans of the Salt River Project, have taken into consideration the practicability of developing power for pumping and manufacturing purposes as an additional asset to this great work. A diversion dam and canal were built about 18 miles above the Tonto Dam for the purpose of developing power in the construction of the dam. This has proved to be very satisfactory, and the power obtained, which amounts to about 5,000 horse-power, is being utilized in running the cement mill, ice plant, electric light plant, dredging, lifting stone into place and all other things neecssary in carrying the work to completion. Other power plants will be inaugurated along the river and canals, so that when the project is completed 20,000 to 25,000 horse-power can be developed for the use and benefit of the people owning lands under this system. As power is greatly in demand in a country where fuel is so dear, this power when leased or sold will bring in a revenue of $500,000 or more annually. This may be the means of returning to the Government the original cost of the works now under construction, and afterwards, a revenue for maintenance, repair, and other expenses incident to the irrigation of so large an extent of country.

Principal Crops Raised in the Salt River Valley. The crops raised in the valley consist chiefly of wheat, barley, oats, sorghum and alfalfa. Although the water supply has never been constant the year round, owing to the washing out of dams and dry seasons of several months at a time, yet the yield per acre as compared with lands in other sections where irrigation is not in vogue, is vastly superior.

The yield of wheat is from 1,800 to 2,500 pounds per acre, or 30 to 35 bushels. Of barley, the yield is 1,500 to 2,000 pounds per acre, or 30 to 35 bushels. Alfalfa for hay is cut from four to six times per year, thus yielding from six to ten tons of dry hay and leaving at least four months of the year for pasturage. Barley and oats are also grown for hay, and when cut in the milk state make fine feed for horses and cattle. Wheat sells for $1.20 to $1.60 per 100 pounds. Barley brings from 80 cents to $1.25 per 100 pounds. Alfalfa hay, baled, from $8.00 to $12.00 per ton. Alfalfa hay in stack from $5.00 to $8.00 per ton. Alfalfa for pasturage from $5.00 to $6.00 per acre per year.

Other Crops Raised. Oranges are grown in this valley, there being now from 1,200 to 1,500 acres devoted to orange culture. The yield is large, and the fruit commands a high price in eastern markets. The Washington navel orange sells in New York for $5.00 to $8.50 per box, or about $3.00 to $5.00 after paying the freight and other expenses. This orange, for flavor and sweetness, has no superior, and is placed on the market a month earlier than California oranges. About one hundred car loads will be shipped out this season.

The grape fruit also does well here, and is more profitable than the orange to the grower. The strawberry, the raspberry and all kinds of garden truck, thrive in this climate, and the yield is very large and profitable to the growers.

Melons and Cantaloupes. This valley seems to be particularly suited for watermelons and cantaloupes, and the yield per acre is very large and the profits good. The cantaloupe ripens earlier here than in most sections, and, owing to the excellent flavor, brings a good price in the Chicago and other eastern markets. The average yield is from 150 to 200 crates per acre, and the price received is from 80 cents to $1.70 per crate net. The country about Mesa, 16

miles east of Phoenix, is celebrated for its famous cantaloupes. The writer knows of one man in this vicinity who, in 1905, from twelve acres, cleared, after paying all expenses of cultivation, picking, crating, shipping and selling, the sum of $1,800, or $150 per acre. Some have realized as high as $200 per acre net. One hundred and fifty to 200 car loads per year are shipped from Mesa to Chicago.

Dates and Olives. This valley is also adapted to the culture of the date and olive. A twenty acre date orchard has been set out by the U. S. Agricultural Department near Tempe, where more than twenty varieties, imported from Morocco, have been brought into bearing. The fruit grows in clusters of 30 to 40 pounds, and three to six clusters to the tree. The fresh fruit brings 25 cents a pound readily in the local market.

Olives thrive here, the trees being especially adapted to drought and heat. Most of the fruit is pressed for oil, although the pickle industry is increasing. Arizona olive oil has a fine flavor, and its keeping qualities are especially good. Olives yield from 200 to 250 pounds of fruit to the tree, and the oil manufacturers pay from $20 to $30 a ton for the fruit on the trees. It takes about 90 pounds of fruit to make a gallon of oil.

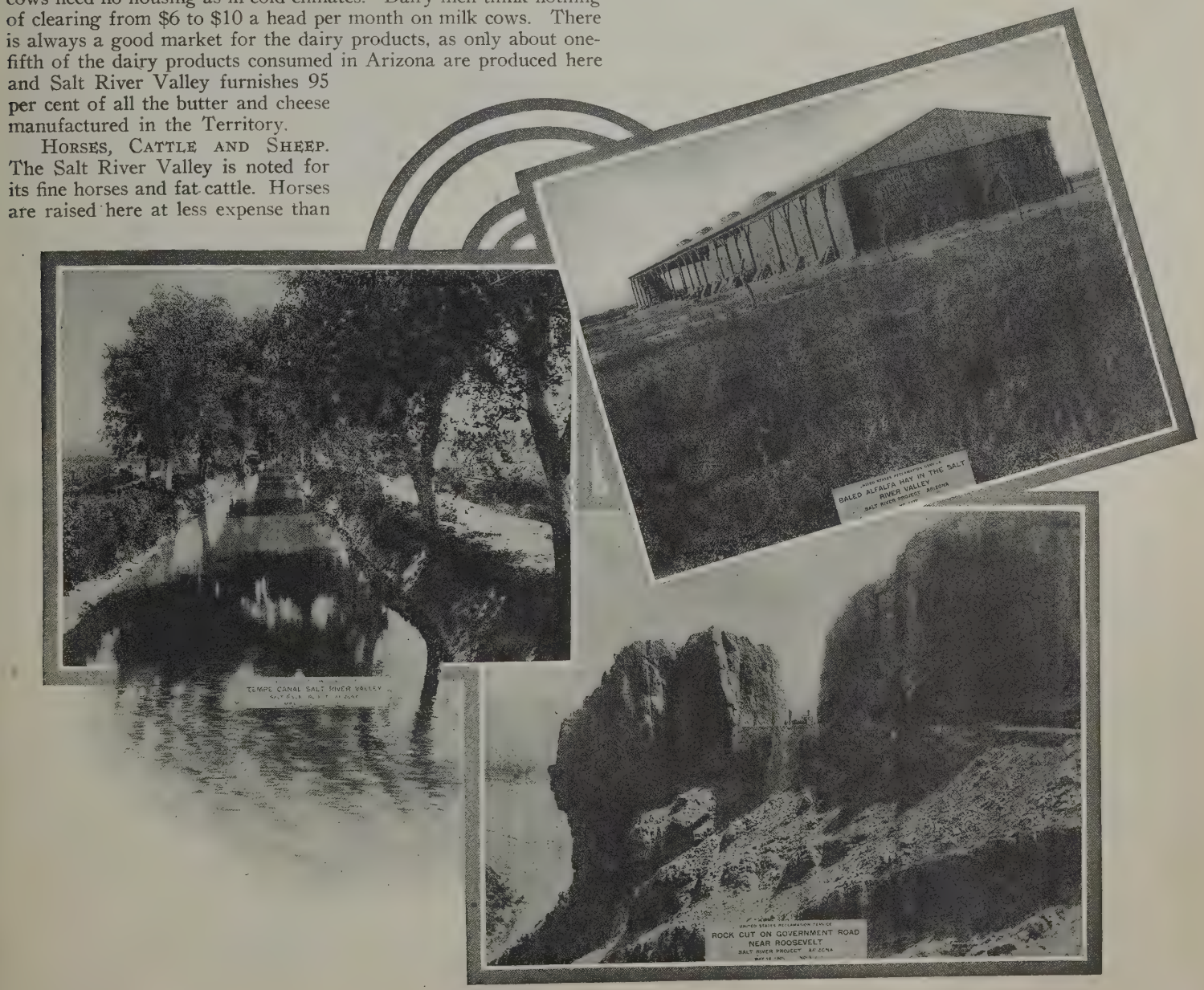
Other Fruits. The peach, apricot, pear, fig, almond, grape and strawberry, all do very well here, and under proper culture, the yield is very large. The strawberry is found on the market here nearly the year round, and the profit to the growers is very large. In some localities near Phoenix one single acre of strawberries has yielded from $500 to $1,000.

Dairy Farming. This is one of the most profitable industries in the Salt River Valley, and is one that is not overdone. The dairy cows need no housing as in cold climates. Dairy men think nothing of clearing from $6 to $10 a head per month on milk cows. There is always a good market for the dairy products, as only about one-fifth of the dairy products consumed in Arizona are produced here and Salt River Valley furnishes 95 per cent of all the butter and cheese manufactured in the Territory.

Horses, Cattle and Sheep. The Salt River Valley is noted for its fine horses and fat cattle. Horses are raised here at less expense than anywhere, and reach maturity a year or two earlier than in colder climates. Here the horses need no protection, more than a shelter, or the shade of a tree from cold or heat. They run at large on the pastures the year round, and at two and three years old cost the owner just about one-fourth as much as they do in colder climates. Horses bring good prices here. Since the location of the Territorial Fair at Phoenix in 1905, an additional impetus has been given to breeding fine horses. As the fair is held in November, the owners of speed horses from the northern and eastern states are every year bringing their "strings" to the valley for winter training in a mild climate, and also for the purpose of contesting for the valuable purses offered.

Many of the finest breeds of cattle are raised in this valley, for beef and dairy products. Cattle are shipped into the valley from the mountain ranges for fattening. After a few months' run on the alfalfa, they are shipped to California and the eastern markets for beef. Beef cattle are sold here from 2¾ to 4½ cents per pound on foot. Thousands of sheep are driven into the valley every winter for shearing and the annual clip amounts to over 1,500,000 pounds. Sheep are also bred in the valley for early lambs.

Poultry and Eggs. Fowls of every kind seem to thrive here and there is always a good price both for fowls and eggs. Chickens and turkeys pay well for the time and money expended. Only a small place is required for a chicken ranch—five to ten acres are ample. The supply does not begin to meet the demand. During November, December and January eggs retail for 40 to 60 cents per dozen. Turkeys retail at 15 to 18 cents per pound, and chickens from $4.00 to $6.00 per dozen.


BALED ALFALFA HAY IN THE SALT RIVER VALLEY
SALT RIVER PROJECT ARIZONA
TEMPE CANAL SALT RIVER VALLEY
ROCK CUT ON GOVERNMENT ROAD NEAR ROOSEVELT
SALT RIVER PROJECT ARIZONA

Ostriches. The Salt River Valley Ostrich has better plumage and is a larger bird than his African parent. The Salt River Valley is the home of two-thirds of all the ostriches in America. This industry, begun a few years ago as an experiment, has grown to such proportions that it is thought by African ostrich farmers that the Arizona field will in a few years put the African farmer out of business. There are several reasons for this; probably the most potent one being the care the bird receives here as compared to his condition on the deserts of Africa.

The ostrich is one of the few birds that lives entirely by grazing and in this valley a pair of birds can be kept on half an acre of alfalfa, if the grass is in good condition, by cutting the half acre into two pastures, allowing the birds to graze on one while the other is growing new grass. Thus by alternating the two pastures if the grass has a good stand and is well watered, one-half an acre will raise two birds that will produce sixty dollars worth of feathers to the farmer each year. In Africa, because of the short pasturage and lack of water to produce more the birds have to range over large tracts of ground two hundred morgans or about four hundred acres being necessary in some places for each bird. Another advantage the Arizona ostrich farmers have is because of the small amount of ground necessary to sustain a bird, it is possible to keep a large number of them under the eye and care of the farmer himself, and this is a tremendous advantage in breeding time.

Ostriches Introduced in America. In the year 1882 ostriches were first introduced in the United States for breeding purposes by a Doctor Protheroe. The idea at that time was that the birds if made to survive in this country would be fine to exhibit. A number were shipped from Cape Town, South Africa, some of which survived to reach New York where they were shipped overland to California, only twenty-one birds arriving. These were the nucleus for the farm started at Anaheim, the corporation being known as the California Ostrich Company.

During the next four years three other persons ventured into the field of ostrich farming in America. The most successful was Mr. Edward Cawston who went to South Africa and returned with forty-four birds. These were later divided, a part going to South Pasadena, California, and a part to Whittier, California. From this shipment fully eighty per cent of the ostriches in America today are descended. During the Pan-American Exposition at Buffalo in 1901, the last lot of ostriches was brought to the United States. These were twelve Nubians. After the Fair six of these birds went to Mr. Cawston who arranged for their importation and six went to the Pearson or Pan-American Ostrich farm west of the city of Phoenix.

The first appearance of the ostrich in Arizona was when Clanton and Company purchased from Mr. Cawston one pair of breeding birds and fourteen chicks. In the course of transportation to the Arizona farm from California, thirteen of the chicks, through carelessness, died and a short time later the female bird was killed. From the survivors, one male bird and the chick, one hundred and four full grown ostriches were sold in 1898. In 1888, Mr. A. Y. Pearson and Mr. J. Taylor established the Florida Ostrich Farm in Jacksonville, Fla., with 30 birds, a part purchased from Mr. Cawston and a part from the original Protheroe shipment. In the spring of 1889 this firm was dissolved and Mr. Taylor took the Florida farm and Mr. Pearson took the California interests of the firm.

The Pan-American Ostrich Farm. The largest ostrich ranch in America at the present time is the one owned by the Pan-American Ostrich Farm located ten miles to the west of the city of Phoenix. In November, 1899, Mr. Pearson purchased a large tract of land—over 1,200 acres—and moved his California stock of ostriches onto this land. Soon after he bought 200 birds and in the course of eight years that number has increased to considerably over 1,200 full grown birds. The feathers of these birds yield annually an income of over $40,000. Each bird is plucked every eight months and averages $20 in plumes at each plucking. The Pan-American Ostrich Ranch presents one of the most novel sights to be found in many a days journey. The great tract of land, green with alfalfa is dotted here and there with great droves of these strange-looking foreign birds that pluck the green growth and thrive upon it. The whole ranch is enclosed with miles and miles of Page fence which proves the safeguard for the birds. A part of the ranch is divided into smaller pens enclosing about an acre of ground each, in which are kept single pairs of ostriches for breeding purposes. The majority of the birds, however, run in droves of several hundred.

Alfalfa seems in every way to meet the requirements for a healthful food for the birds. The average bird eats four pounds of the green hay per day while a western steer will consume about sixty pounds of alfalfa per day. The common herd of ostriches is fed nothing except this green pasturage and to aid in digestion quartz is broken up into sizes about as large as hickory nuts and scattered about the fields where they feed and they eat these stones with their food in the same manner that the chicken swallows smaller gravel. In some cases the birds kept in the smaller pens for breeding purposes are fed small amounts of grain daily. It is a peculiar fact that the climate of the Salt River Valley seems to agree with the native requirements of an ostrich. Rarely, if ever, is an ostrich sick. The average life of one of these huge birds is seventy-five years, but the average time of usefulness is about forty to fifty years. After that the bird begins to deteriorate and its plumage loses its brilliancy and the zenith of the bird's career is passed.

From the present outlook it appears that within the next five years the Pan-American Ostrich Farm will have pasturing in its alfalfa fields more than five thousand of these birds. During the plucking season the farm is thronged with tourists, the novel sight which results in leaving sad looking ostriches and in the decoration of thousands of hats for the fair sex all over the world.

It is claimed that the plumage of the birds raised in Arizona is more beautiful than the plumage of the birds from South Africa, and London critics claim that the difference is so marked as to make the plumage from the Arizona birds worth more than those shipped from Africa.

Access by Railroads. The Salt River Valley is reached by branch lines from two transcontinental railroads. From Ash Fork, on the main line of the Santa Fe System, 197 miles north of Phoenix, runs the S. F. P. & P. Railway, which terminates at Phoenix.

At Maricopa on the main line of the Southern Pacific and Rock Island System, is one of the terminals of the M. & P. & S. P. V. Railway, the other being at Phoenix. The distance from Maricopa to Phoenix is 35 miles. A branch from this road runs from Tempe to Mesa City.

The Phoenix and Eastern Railroad has been built from Phoenix beyond Florence. This line will no doubt tap both the Southern Pacific and the Santa Fe Systems, and will be extended from Phoenix by Wickenburg westward to California. Tourists' rates from eastern points to California apply to Phoenix. Any one visiting the

Pacific coast may obtain stop-over privileges at Maricopa or Ash Fork for Phoenix by paying $3.50 extra for round trip ticket. A first-class ticket from Chicago to Phoenix is $53.85. From New Orleans about the same.

Schools. The County of Maricopa, and especially the Salt River Valley, has good public schools. The school buildings are comfortable, and so located throughout the valley, that they are in easy reach of the children. The standard of our schools is high, education compulsory, and the teachers are all of good moral character and fully competent. The county has 105 schools; 29 grammar schools and 76 primary schools. The large towns also have high schools. The number of children in the county between the ages of 6 and 21 years, are 5,741; the number enrolled in the public schools is 4,553; the number enrolled in private schools is 300; number of teachers employed 117; money received for school purposes for 1907 $98,765.33; amount paid to teachers, $65,516; average salaries paid male teachers, $90; average salaries paid female teachers, $70.

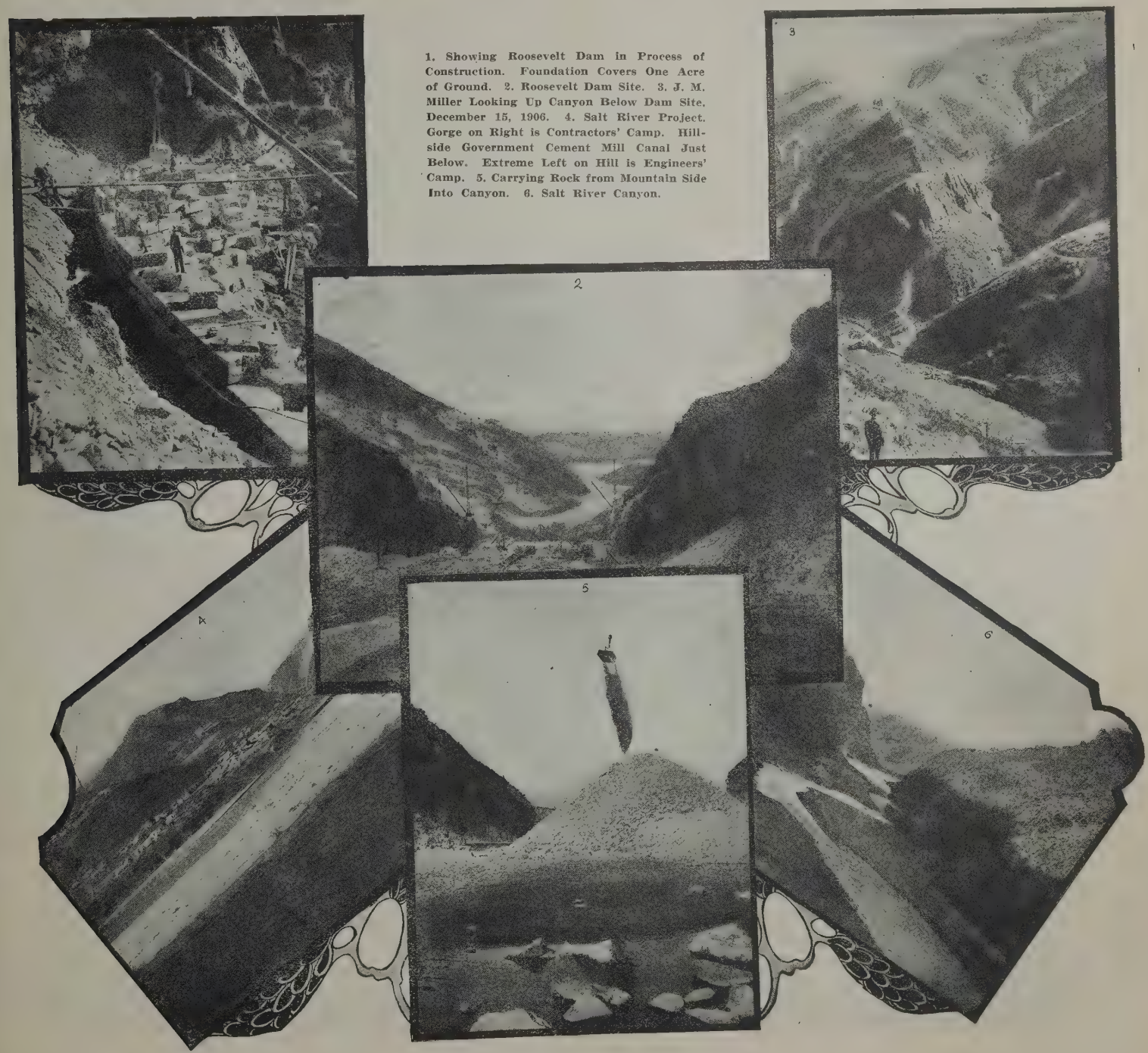
Wages. Carpenters are paid from $4.50 to $5.00 per day. Brick masons from $6.00 to $8.00 per day. Laborers from $1.25 to $1.50 per day and board.

Expense of Living. Hotels charge $2 per day and upwards. Board can be had from $5 to $10 per week. Rooms, furnished, from $8 to $30 per month. Furnished houses from $25 to $150 per month. Unfurnished houses from $15 to $50 per month.

A Word to Healthseekers. The Salt River Valley has become celebrated as a health resort, and every winter, Phoenix, Tempe and Mesa, are filled with healthseekers and tourists. Every comfort can be had here. Nourishing food, such as milk, cream, butter, eggs, fresh meats and fruits of every kind are within the reach of all.

While the benefits derived from a short stay are great, and in many instances lasting, yet to receive the best results, one should remain here some time. This section is sought by those suffering from tuberculosis or consumption, yet there are other complaints, such as catarrh and asthma, that are relieved by this mild and dry climate.

No one should come here seeking health unless he has money enough to last him from six months to a year, as it is very difficult for sick persons to find employment. By economizing an invalid might get along on $50 per month, but he should have $75 to $100 per month, for six months or a year if he expects lasting benefits. Phoenix has hospitals and sanitariums, but they are not free institutions. We have good and reliable physicians, but they cannot attend patients free of cost.



1. Showing Roosevelt Dam in Process of Construction. Foundation Covers One Acre of Ground. 2. Roosevelt Dam Site. 3. J. M. Miller Looking Up Canyon Below Dam Site. December 15, 1906. 4. Salt River Project. Gorge on Right is Contractors' Camp. Hillside Government Cement Mill Canal Just Below. Extreme Left on Hill is Engineers' Camp. 5. Carrying Rock from Mountain Side Into Canyon. 6. Salt River Canyon.

Phoenix, Arizona's Beautiful Capital City

PHOENIX is the "Garden City of the Great Southwest." The very name whispers a mystery of milennia, still unsolved, still promising a greater beauty, a greater wealth, indestructible, because even its end forebodes only a new birth in even greater splendor, and this must come soon.

Phoenix rose, not from its own ashes, nor from the burned sands of a sun-parched desert. It rose on the oasis of the Salt River Valley upon the ruins of its Toltec forefathers, laying the claim of an infant heir to the longest line of ancestry of any city within the borders of the Union.

Standing on sacred ground, sanctified by a mysterious civilization of a race, marvelously evolved at a time too far remote for us to explore, leaving behind only mute witnesses of their skill and energy, it invites metaphors and compels superlatives. Bathed in sunshine, swept by the cool winds from the mountains, endowed with agricultural wealth through the medium of its many canals, colored with the hues of the Arizona sunset, and hallowed by the romance of Indian lore, it shines brilliantly and with a color all its own, in the bright galaxy of stars of the Union's capital cities.

Phoenix is indeed the "City of Resurrection;" the head and heart of a land growing up through the treasures hidden in the bowels of the earth, through the yield of fields and meadows, just awakening from a slumber of thousands upon thousands of years.

To the traveler from North, South or East, Phoenix is a surprise, as much so today as it was in 1868 to Jack Swilling, who tired of mining, took up a farm a few miles from the present heart of Arizona's Capital. And why should it not be a surprise? 'Tis the "Sun Land of Promise, Romance and Health," and there are volumes of romance, of history, of scenic beauties, of climate, of natural wealth, of progress, that could be written in addition to those that have already been published with Phoenix, its people, and its traditions as their subjects. But after all has been said, the fact remains that its climate, its sunshine, its history and its resources, set this part of the Territory apart from all others, that directly or indirectly influence all its industries, all its activities, its very nature.

Nowhere else in the world is there found a more perfect climate, and but few sections can boast a climate as good. It is not only a lovely day now and then, not only a pleasant summer or a pleasant winter, but a perfect all-the-year-round climate that is making Phoenix and its immediate vicinity the sanitarium of the world, the refuge of those stricken by one or the other of the many forms of lung, throat and nervous troubles.

Phoenix is not quite thirty-five years old. How has it developed? How has it become the principal city of Arizona? How has this come and that come, are long-winded questions, that will be, and to some extent are, recorded in the annals of history. Let us have a flashlight of the beginning, the resurrection of Phoenix, and then a moving picture of the Phoenix of today.

As I mentioned above, Jack Swilling, a man of rare daring, was the first to settle down in this vicinity, which at that time swarmed with blood-thirsty Indians. Then others followed. In 1869 the settlers decided to start a town; a meeting was held and a committee consisting of Moor, Grifin and Dupper was appointed to select a town site.

Dupper, or "Lord" Dupper, as he was called, was quite a character; an educated reprobate of an English noble family, who was sent to Arizona to be buried alive, and drew a yearly allowance to

Phoenix Homes

air his brandy-soaked anatomy and bleach his black reputation in the virgin atmosphere and eternal sunshine of Arizona.

Anyhow, he it was who first had the idea of calling the selected spot Phoenix, to imply the resurrection of the numerous ruins of Toltec civilization. The idea found favor and the name was adopted. In 1870 the town was laid out in lots and the first one was bought by Judge Berry of Prescott, for $104. It is the property upon which the Irwin building now stands. In 1871 the county court house, and the first school were built, and William Smith opened the first store. From 1873 to 1876 Phoenix was in constant danger of destruction by the bands of marauding Indians. Only after the conclusion of peace made by General Crook, and the removal of the Indians from the country surrounding Phoenix, the town began to grow; supplying the mining camps with food and other necessities. From 1876 to 1908, or in thirty-two years, Phoenix has made wonderful strides.

From a camp of about five hundred people it has risen to a cosmopolitan city of about 16,000 permanent residents, harboring every winter from four to five thousand tourists within its limits, attracted by its unequaled winter climate.

The city is well laid out with wide streets and sidewalks. Beautiful parks surround the public buildings, and the residence districts are nicely shaded. The city has a high school, a grammar school, and five ward schools in the public system, in which are enrolled about 2,700 children. There are also several private schools in which are enrolled from 300 to 500 pupils.

Twelve church denomiations are represented, and all have beautiful and commodious houses of worship. A new Y. M. C. A. building will soon be erected, and for this edifice $100,000 was subscribed in less than thirty days. The city has electric street railways, electricity and gas for lighting and heating, five banks, three theaters, a Carnegie public library, water works, and all the conveniences of the modern, up-to-date city. The altitude of Phoenix is 1,076 feet above sea level, the mean annual temperature is 69.3 degrees, and the average wind velocity is five miles an hour.

Frosts are very light during the winter months, and there are no cold winds or cyclones. The city has the best of hotels and boarding houses, any number of first-class restaurants, and is extremely well prepared to take care of strangers seeking health or investments at reasonable rates.

"Climate is Fate!" exclaimed Helen Hunt Jackson, when racked with pain, and in the hands of the insidious destroyer, consumption.

She sought the climate of California and of Colorado and was much benefited. Had she sought the climate of the Salt River Valley, perhaps she might have lived another decade and have given the world another "Ramona."

Thousands have risen to bless the sunshine, the invigorating and dry air of Arizona, and thousands have died because they knew not of it, or came too late to be restored.

As the altitude gradually declines from 8,000 feet in the northern part of the Territory to a little over 1,000 feet at Phoenix the climate is modified so far as the mean annual temperature is concerned, therefore the sharp winter winds of the north are entirely absent in Phoenix.

It may be stated in a general way that all specific plans of therapeutic treatment thus far suggested for the cure of tuberculosis, and especially of pulmonary form, have failed, so that one must look to nature rather than to the laboratory for the weapons to combat this enemy of the race.

The early diagnosis of pulmonary tuberculosis is of the utmost importance, for it is in the beginning of the diseases that the greatest benefit is derived in the largest proportion of cases from the climate or the out-of-door plan of treatment.

Phoenix is essentially a "land of sunshine and blue skies." Here there is a dry and bracing climate, with no extreme heat or cold, a climate which, for the most part, admits of an existence out of doors almost the year round. It is these qualities of air and sky that have caused this favored region to be known today over the entire civilized world as the "Land of Sunshine." The peculiar aadaptability

of such a climate to the successful management of consumption and other diseases of the lungs and respiratory tracts is causing invalids to flock here in great numbers, experience and observation having demonstrated beyond further question the fact that the sea-coast resorts have proved dismal failures in exercising either a corrective or retarding influence upon the diseases mentioned above.

The famous Dr. Osler, once so much in the public eye, says: "The requirements of a suitable climate are a pure atmosphere, an equable temperature not subject to rapid variations, and a maximum amount of sunshine."

The purity of the atmosphere is the first consideration, and it is this requirement that is met so well in the mountains and deserts of the Sale River Valley. The problem of the prevention of the further spread of tuberculosis and its ultimate and complete eradication from the human race will be solved when all physicians realize the importance of at once placing the patient suffering from, or threatened with, this disease, in a suitable climate. Children inheriting this peculiar condition of the cellular structures and cell antagonism to the disease which can never be acquired in a climate where tubercular diseases are more common and one which favors the causes that lead to tubercular disease. It is generally conceded by writers upon bacteriology that climatic conditions play a most conspicuous part in both development and retardation of microbic life. Epidemic diseases which have for their vehicles certain conditions of the atmosphere, such as heat and moisture, constantly demonstrate their power of spreading contagion, the moisture contained in the air being the chief factor in preserving the vitality of the germ. To anyone familiar with the extreme climatic difference between the Atlantic Coast states and the Southwest, the great role played by the climate in each locality named, will at once become strikingly apparent to the most indifferent observer. Epidemics, such as la grippe, so fatal and destructive in their train of sequelae, are little known in or near Phoenix. This is rather remarkable, in view of the fact that the majority of the people live in an humble and primitive state, and in the rural districts, scarcely ever employing any modern sanitary precautions to guard against epidemic invasions. The climatic conditions existing through the valley and in the mountains around the city, the rarity and purity of the atmosphere, together with the almost constant direct rays of the sun, are the most powerful bactericides known to science today. A climate where discarded animal and vegetable substances undergo prompt and rapid desiccation after brief exposure to the atmosphere, with but little manifestation of decomposition, argues most strongly against bacterial development. The tuberculus bacilli lose their infective power in a very short time after exposure to the sun's rays in the arid atmosphere. This clearly explains the curative effect of climate upon pulmonary tuberculosis. Constant inhalation of what may be properly termed as aseptic atmosphere, in time brings about in the pulmonary tissues, inflamed by tuberculous deposits that very desiccation effected upon animal and vegetable substance exposed directly to the air. Although there are many invalids, principally persons with tuberculosis, there is not a case of tuberculosis on record in Phoenix that was communicated from the diseased to the healthy through the medium of the atmosphere. That the native people of this section experience such wonderful immunity from tuberculosis, must have its explanation in the very favorable surrounding climatic conditions.

In order to derive all possible benefit from such a climate as that of this city, the healthseeker should live out of doors. If he has the strength to get out at all the best that he can do it to go out on the desert and camp out. The nomadic life of the tent dweller is the best treatment for incipient pulmonary tuberculosis. It is often a grave mistake for an invalid to seek a change of climate in a place where he has no friends, no occupation, nothing to distract his mind from himself and his malady. In a few months he exhausts all the possibilities of mere curious interest in unfamiliar surroundings, and then he strolls about alone or with chance acquaintances until he becomes weary of the town and the montony of his existence. Homesickness ensues, the mental disease sometimes counterbalancing the climatic benefit ,and the healthseeker in desperation returns to his home, preferring the certainty of death among friends to the possibility of a prolonged existence under unsupportable conditions. If such a healthseeker would purchase a saddle horse and a camp outfit and go out on the desert or into the mountains with agreeable companions, he would find no monotony and no homesickness, but would gain in strength and buoyancy of spirit and never know a dull hour. A year of outdoor life in Phoenix out in the dry, bracing air, will arrest many a case of incipient pulmonary turberculosis, if the sufferer has the necessary strength and vitality to begin a course of treatment and takes even ordinary precautions against undue exposure and over-exertion. In the past few years the medical profession, as well as the laity, has been made aware, through various channels of the vastly superior climatic conditions existing throughout the valley, and patients are seeking relief here by the hundreds where formerly they came only by the scores or dozens. That the city of Phoenix has reached its present position upon a foundation secure beyond peradventure, is but a convincing proof of the certainty with which nature secures her ends. As year by year business area, increased the value of real estate, lengthened its streets, improved its general appearance, built up elegant mercantile, residence and public edifices, added to its general wealth and made its citizens prominent in the councils of the Nation, its advantages have been made known, and others invited to share in the sure rewards of produce, energy and industry. New residences, luxuri-

GERONIMO'S WARRIORS TODAY

1. They Are Washing Out the Blood of Massacres by Helping Put Water on the Fields.

2. Industrious Apache Basket-Maker, Wife of one of the Apache Laborers on Salt River Project.

3. Cement Mill, Salt River Project, Arizona.

ously appointed mansions and handsome business houses are springing up all over the city.

TEMPE. This town, which is about nine miles east of Phoenix, has 1,500 inhabitants, and is located on the south side of Salt River in the midst of a rich farming country. The Territorial Normal School is located at Tempe, with fine buildings, and beautiful grounds, affording accommodation for 200 or more pupils. Several new buildings are being constructed from recent generous legislative appropriations in order to keep pace with the growth of the Territory, which is very proud of its system of public schools and educational institutions. Tempe enjoys the distinction of owning its own water plant, which supplies the town with abundant water for domestic and fire purposes at a reasonable cost. The churches, public schools and fraternal organizations are representative and adequate. Tempe has electric lights, good hotel, two good banks, a flouring mill, and a condensed milk plant. The lands about Tempe are very fertile, and have always enjoyed a good supply of water for irrigation.

MESA CITY. About six miles east of Phoenix is situated this beautiful town. It is well laid out with broad streets, and has a population of about 1,500. Mesa has a high school and graded schools in which are enrolled about 800 children. Mesa has a good hotel, a strong bank, churches, and is lighted by electricity. The lands about Mesa are very fertile, and are especially adadpted for growing grapes, melons, cantaloupes and fruits of every description. From Mesa are shipped annually hundreds of car loads of cantaloupes of the choicest and sweetest flavor, that readily command the highest price on the eastern markets. Several large pumping plants for irrigation are being operated near Mesa, furnishing a continuous supply of water for thousands of acres of land, one ranch alone irrigating 3,200 acres from pumped underground water. Alhambra, Glendale, Peoria and Scottsdale, are all thriving villages, from four to fourteen miles from Phoenix. They are all situated in the Salt River Valley in the midst of the rich farming lands.

BUCKEYE. This village is situated about 30 miles west of Phoenix, in a district noted for its grain, alfalfa and fat cattle. The Buckeye Canal, which irrigates this district, receives an abundant supply of water by means of a diversion dam across the Gila River below its confluence with the Salt, and just west of the Agua Fria River. Ranch cattle are driven in for feeding in thousands each year, and the exports are fat cattle, besides hay, grain and hogs. Cotton is also grown successfully in this vicinity.

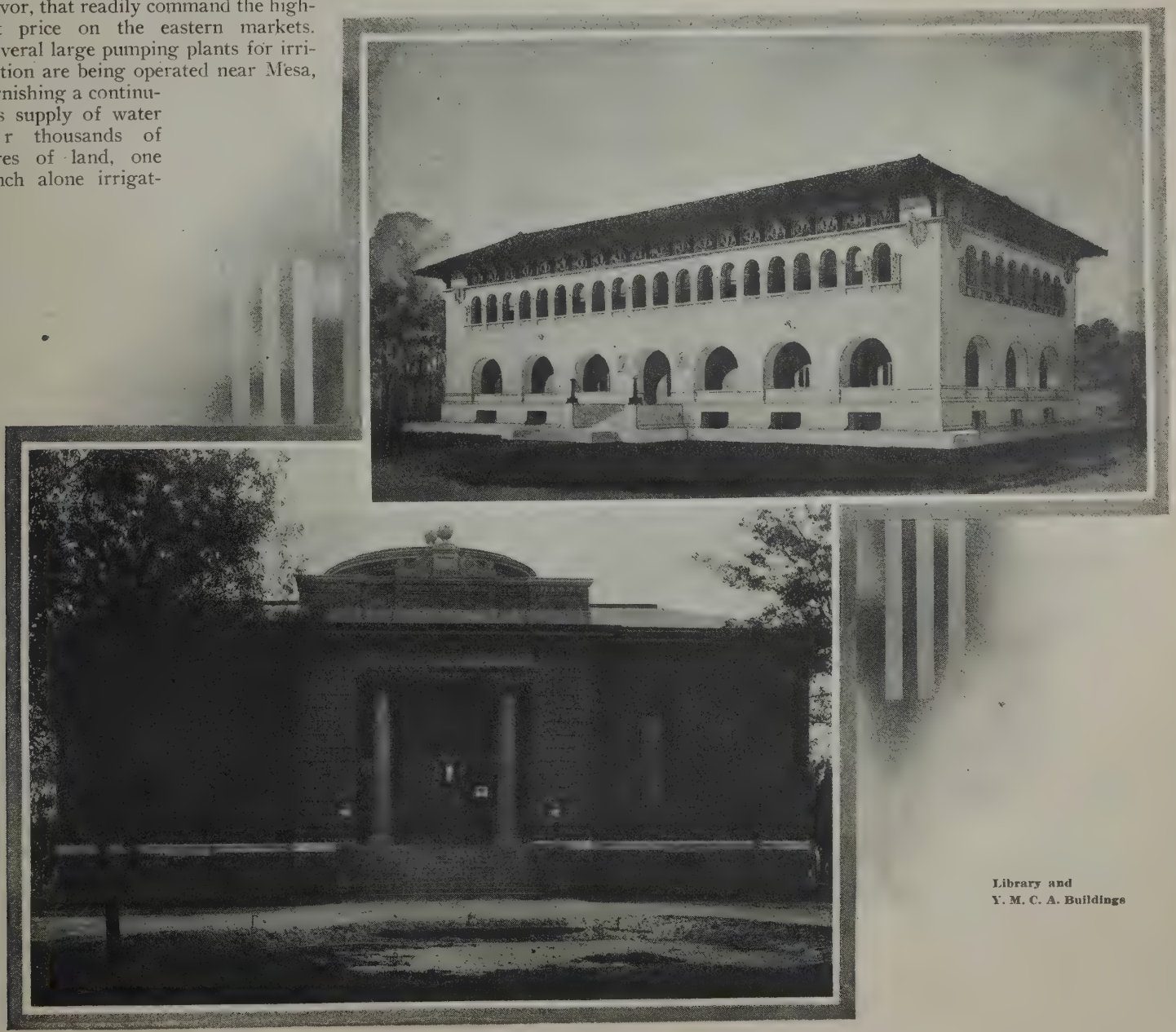
ARLINGTON. West of Buckeye is located Arlington, which gets its supply of water for irrigation from the Gila River. The lands are very productive, and the people prosperous and hospitable.

QUESTIONS ANSWERED that may be of interest to the homeseeker, the investor or the tourist:

1. Where is the Salt River Valley? In Maricopa County, in South Central Arizona, comprising the land lying on both sides of the Salt River, above the confluence of the Salt and Gila.

2. How large is the Salt River Valley? The valley, proper, is about 50 miles in length by 15 miles in width, containing about 750 square miles, aggregating about a half million acres of land.

3. How much of this land is now in cultivation? About 125,000 acres.



Library and
Y. M. C. A. Buildings

4. How much will be irrigated when the Tonto Dam or Salt River Project is completed? About 200,000 to 250,000 acres.

5. When will the Tonto Dam be finished? It ought to be finished during 1909 or 1910.

6. How is the climate of the Salt River Valley? The climate is mild. From September to June the climate is delightful. From June to September the weather is warm.

7. What is the lowest temperature in winter? The lowest recorded is 22 degrees above zero.

8. What is the highest summer temperature? On one occasion within twenty years, by U. S. Weather Bureau record, the thermometer has gone as high as 117 degrees.

9. What is the average summer heat? About 87.7 degrees.

10. What is the average rainfall per year? Six or seven inches.

11. How about storms, snow and ice? We have little frost, no snow, very little ice. No violent storms or cyclones.

12. How does the heat affect one? A temperature of 90 to 95 degrees in the eastern states is far more prostrating and dangerous than the highest temperature experienced in the Salt River Valley.

13. What is the cause of the difference? The absence of humidity in the atmosphere.

14. What is the cost per acre per year for water? From $1.00 to $1.50 per acre.

15. How is water obtained for domestic purposes? From wells from 18 to 100 feet deep.

16. How about the market? This valley supplies the Arizona towns and mining camps, also California and eastern cities.

17. Is it profitable to keep bees? Yes, this is a very profitable business, and carloads of honey are shipped out of the valley every year.

18. How are the roads? Most excellent the year round, only now and then a little muddy.

19. How many acres of land are necessary to support a family? From ten to twenty.

20. Is there any Government land in the Salt River Valley open for entry where water can be obtained? At present, no, as the Government has withdrawn the lands from entry until the Salt River Project is completed.

21. How would a new settler procure a home? By purchasing from some one who owns more than he needs.

22. Can small farms be obtained? They can. Many of the large farms will be cut up, and sold in ten and twenty and forty acre lots.

23. Can farms be rented? Yes, they can be rented for cash or on shares.

24. What fuel is used? Wood, coal and oil.

25. Is wood expensive? Wood in the towns costs from $5 to $6.50 a cord. The farmers usually raise their own wood from the cottonwood trees around their farms. A farmer by planting cottonwood sprouts or cottonwood posts for wire fence, can in a few years have living trees for posts and all the wood he needs for years to come.

26. What advantage does this valley offer to the farmer over other sections? With 82 per cent of sunny days, it is possible for laborers to work out of doors nearly every day in the year; the great yield for the labor bestowed, and good prices for crops. In addition to this, we have good roads to market, good schools for the children, free rural delivery, and telephone connection all over the valley.

27. What is the price of lumber? From $35 to $50 per thousand.

28. What is the rate of taxation? Territorial, county and school tax combined is about $2.50 to $2.60 per $100, assessed valuation.

29. Is property assessed at full market value? No, about one-third.

30. What inducements are offered healthseekers? The mild and equable climate permits a constant out-of-door life; bright sunny days and immunity from changeable weather gives nature a chance to recuperate without medicines.

31. What inducements are offered to winter visitors? Hotels and boarding houses at reasonable rates, hunting, magnificent scenery, beautiful drives, good theaters, hospitable and cultured society, freedom from cold winds, snow and changeable weather.

32. What will be the cost of the Salt River Project, including the Tonto Dam and Reservoir, diversion dam, etc.? About $25 to $30 an acre for the 200,000 to 250,000 acres to receive the benefit. Payments will be made in ten equal annual installments without interest, but will not commence until the reservoir is completed.

33. What has become of the Indians? The Indians are all peaceable, and are busily engaged in tilling the soil, while their children are being educated for a life of usefulness by the U. S. Government.

34. Do they have good schools? Yes, the U. S. Government has a number of schools for the Indians. One near Phoenix has 700 pupils from thirty tribes. The boys are taught useful trades, while the girls are taught housework of every kind.

35. What becomes of the Indians when they leave school? Many of them are hired out for servants among the white people. Others go back to their farms. Some become teachers and mechanics.

WANTS OF THE SALT RIVER VALLEY. While the Salt River Valley possesses a great many advantages over other sections and offers rare inducements to homeseeker, the laborer, the tourist and the capitalist, yet there are some things we are in need of. Among our greatest needs are the following:

A woolen mill to work up the wool clip of the vicinity, amounting to 1,500,000 pounds to 2,000,000 pounds annually.

Families to settle on small tracts of irrigated lands from 20 to 40 acres per family. Strong able-bodied men, who are not afraid to work. All laborers, whether skilled or unskilled, can find steady employment at good wages. Truck farmers, fruit growers, dairymen, and poultry raisers can make money here on small investments.

A cannery is greatly needed.

PRICES OF LANDS—SALT RIVER VALLEY. Improved lands sell from $75 to $150 per acre. Unimproved lands sell from $50 to $75 per acre. The price of lands has advanced from 50 to 100 per cent in value within the past year. The limit has not been reached yet, as similar lands under Government irrigation projects in other localities are worth from $250 to $500 per acre.

Prescott, The Queen City of Arizona

IN THIS sketch of one of the most progressive and prosperous towns in this section of the Southwest, it is the writer's object to present, as briefly as is consistent with the importance of the subject involved, an intelligent description of conditions as we find them in order that the readers of the Souvenir may form a correct idea of the rich resources and advantages of Prescott and the surrounding country.

To accomplish this it is not necessary to deal very largely with the history of the past. Prescott was established by a band of hardy pioneers and settlers from various parts of the civilized world in 1864, and the town is named after the famous historian of the Spanish conquest by that name. The town prospered from its inception and each year witnessed a steady and substantial growth as the country became better known to the world.

In July of the year 1900, the city was visited by a disastrous fire which destroyed about a million and a half dollars' worth of business property, residences, etc. This was a hard blow to the growing city, but the people gathered together and met the blow like brave men and women and the day after the fire, began plans for the rebuilding of a new and greater Prescott; and that they have succeeded is evidenced in all parts of the business and residence sections of the present city, where handsome and permanent stone, brick and frame blocks and homes have been erected, stronger and more substantial than before the fire.

In Prescott the business world is wielding and working the present in preparation to meet and grasp the future and has little time or disposition to look backward, however profitable it would be to do so. Prescott is not an old town, in the sense that age is generally understood. Less than 25 years ago the population did not exceed 1,000 and boasted of few important enterprises with the exception of a few mines in the rich mineral section surrounding the city. Today it has 6,500 inhabitants and industrial enterprises and mercantile interests of almost every kind which are noticed in detail in this publication.

This brief announcement is in itself a story of development and progress without a parallel in the industrial history of the Southwest. And it is all the more creditable to the people that these results have been achieved by people brought together from various sections of the world and built up with capital taken from the mines of the wonderful country surrounding the city. When all the rest of the Southwest went wild over the various "booms," the people of Prescott pursued the even tenor of their way, building upon solid foundations that have not been weakened by reverses. And during the financial stringency of 1907 that forced nearly every city and town in the country into the clearing house class our two commercial banks, two savings banks and one trust company continued to pay all checks presented by depositors in gold, paper or silver as asked for in the usual manner, and the citizens of Prescott felt no uneasiness about the solvency of their financial institutions nor the city's credit. Indeed, depositors felt such confidence in their home banks that, all told, there were not more than a dozen withdrawals.

In Prescott the capitalists in search of locations for industrial purposes will find this the ideal city. Residents of other sections of the country may come to Prescott with the assurance of receiving a cordial welcome and finding a pleasant home among people than whom there are none better on earth.

In point of healthfulness, picturesque scenery and bright prospects for future development and prosperity this particular section is most desirable. Prescott has gained an enviable reputation as a health resort for invalids, as well as those who find it necessary to seek in elevation, pure air and water, recovery from the effects of debility or overwork. This entire section of Arizona is pre-eminently salubrious. Possessing an elevation of 5,432 feet above the sea level in a pure mountain altitude, and a sandy, porous soil that absorbs the rainfall and prevents humidity of the atmosphere and noxious gases consequent upon the decomposition of vegetable and animal matter, we enjoy freedom from cyclonic diseases and those of an epidemic character to a degree not surpassed by any other section of the West. To quote a learned medical practitioner and health authority who has visited Prescott, we might say, "the topographic conformation, equal and salubrious climate, clean, high and graded streets, the ample, highly cultivated and tastefully arranged grounds that surround the homes of the city, conspire to make Prescott a desirable and inviting place of residence."

The advantages of such a climate as this cannot easily be exaggerated. The heat of the summer days rarely exceeds 90 degrees, and but few days at a time of winter ever reaches the freezing point. The water is excellent and the man, woman or child who cannot maintain health and strength here would pine away anywhere else on earth. Then again, Arizona hospitality awaits the people of the North, the East, the South and the West who may desire to locate where there are innumerable advantages and few disadvantages, and the opportunities for profitable investment are not duplicated by any other section in the Southwest. Prescott's educational, religious and social advantages will be found all that the most ambitious, pious and fastidious can reasonably desire.

LOCATION OF PRESCOTT. Prescott is located on the Santa Fe, Prescott and Phoenix Railway. The city is 141 miles distant from Phoenix, the Capital of the Territory of Arizona, and 57 miles from Ash Fork, where the Santa Fe, Prescott and Phoenix Railway connects with the main transcontinental line of the Santa Fe System for the east or west. Prescott is 544 miles from Los Angeles, 1,376 miles from Kansas City and 854 miles from San Francisco.

The city is in the center of what is known throughout the country as the "richest mineral section of the Southwest."

THE PEOPLE. The rapid strides which this town has made in advancing its material interests is owing primarily to the fact that the leading business men of the place, (most of whom are old residents), have created a nucleus for a mining town determined not to rest content until recognition was had from the mineral and

commercial centers of this and other sections. While at all times willing and anxious to extend a hand of welcome to newcomers possessing energy and capital, they at no time relaxed their grasp on every situation as it existed, fully realizing that outside capital was to some extent a necessary consideration, which in course of time would naturally flow to such towns as had created a diversity of permanent mining and mercantile enterprises, giving every assurance of success. Ever cognizant of the fact that unless they utilized the advantages they possessed, by creating and fostering new industries and mining elements, the confidence of outsiders would not be

great enough to cause them to invest in their midst, they forged ahead in the commendable work of developing mineral properties, establishing mercantile houses and industrial institutions, until today Prescott has as great a diversity and more and representative mining interests than any town in Arizona. To this cause almost exclusively, is due the substantial prosperity of the place.

Few mining towns throughout the whole country can boast of as large a per cent of true, good, law-abiding and intelligent citizens as can this progressive city. From the humblest citizen living in a two-room cottage to the wealthiest mine owner or banker, enjoying surroundings of culture and refinement there is an air of contentment and satisfaction rarely seen among any people. This is due principally to the fact that both rich and poor are constantly employed and find little time to brood and fret over their condition in life, and as long as the mining interests of Prescott and vicinity continue as prosperous as they have been there is little doubt but what all will remain contented. The majority of day laborers find remunerative employment in the many mines and diversified plants.

The Homes. The homes of Prescott, embowered in the shades of beautiful trees and lingering in the presence of sweet, attractive flowers, are places where the soul delights to find release from busy cares of life. From the simple cottage to the home of wealth, the vision rests upon a panorama, garbed in the dress of flowered loveliness. These citadels of the heart are exponents of the grace and culture of Prescott's home life.

The Yavapai Commercial Club has a modern home costing $50,000 with its furnishings, its membership embracing practically all the business, professional and money men of the community. It has a fine library and reading room, cafe, buffet, ballroom, billiard room, card room, bowling alley, and rooms to accommodate a number of non-resident members.

Society. As a polished society center Prescott is noted in the brilliant courts of the Southwest. The circles have golden links of Christianity, musical, literary and scientific culture. Men with chivalric mein, with women of sweet, attractive grace, give joy, peace and purity to the social world of the city. No city in the Southwest can boast of a purer social atmosphere.

Silver Lights. The streets, business houses, public buildings, hotels and private residences of the city are brilliant in the glow of the electric light system. When the sable goddess drops her pinions o'er this beautiful mountain city, the shimmering lights, as they play "hide and seek" amidst the foliage and flowers, present a rather fantastic picture.

Business Homes. Block after block of business houses greet the observer's eye. Metropolitan stocks are carried by the business men, and it is absolutely unnecessary to sand away from Prescott to obtain your goods, no matter what the call may be for. Large department stores, clothing and furnishing goods establishments and other houses are conducted along progressive lines.

City Government. The government and control of city affairs is vested in a mayor and board of aldermen. The administration for some years past have been able and active. The present mayor and board of aldermen are in line with their predecessors, and are constantly devising and inaugurating such new work as will prove a benefit to the people they represent and a testimonial of merit for efficiency to themselves.

Real Estate. The real estate interests of Prescott, although great, do not indicate fictitious values. Lots of every size can be purchased at reasonable prices on the easiest terms. City taxes are reasonable and improvements of a substantial nature are constantly being inaugurated. All of the main thoroughfares and many of the more important residence streets are well paved and afford good driving.

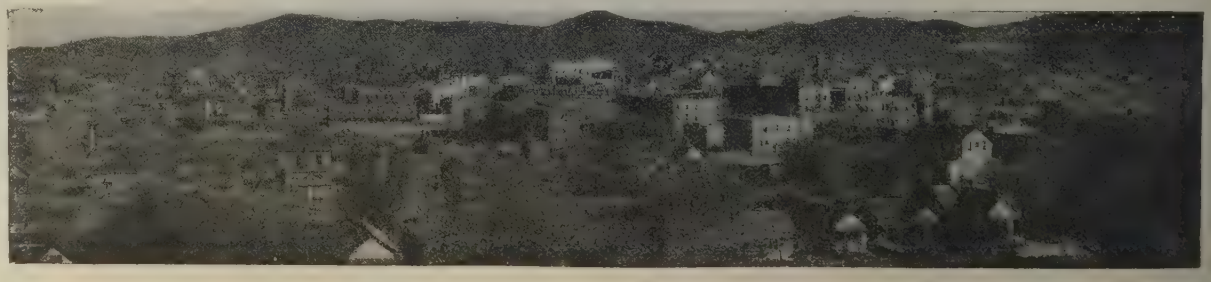
Water Works. The city has water works and in consequence it never suffers from not having a good water supply. A number of fire hydrants, together with watering fountains, are distributed in various sections of the town.

Fire Department. The city has a well organized and equipped fire department, having about everything necessary to combat flames, including a chemical fire apparatus.

Banks. There are two of the strongest financial institutions located in Prescott to be found in the country; the Prescott National Bank and the Bank of Arizona, each carrying deposits of more than a million dollars at all seasons of the year, these deposits amounting to $1,500,000 at various times during the year at each bank. The Yavapai County Savings Bank is a new savings institution, ably managed and carrying deposits of more than a quarter of a million dollars, and just about a year old. The Commercial Trust Company transacts a general trust and savings bank business, handling real estate, etc. These institutions are splendidly and heavily backed and are doing an excellent business.

Newspapers. The City of Prescott has two daily papers ably editer ,the Arizona Journal-Miner and the Courier, the Journal-Miner being the oldest established paper published in the Territory. The editor is Mr. J. W. Milnes, a newspaper man of wide and varied practical experience.

Industrial and Social Advantages. These advantages are supplemented by many successful enterprises already enumerated in the foregoing columns which need no repetition here. While proud of its mining and mineral interests, which are well calculated to inspire hope and energy, there are yet social and educational advantages equally as great. No city of equal population can boast of



greater religious freedom and political tolerance. Prescott has emphatically a cosmopolitan population, representing all section of our common country. Its successful men are the architects of their own fortunes, and rejoice in the local conditions, which, from the beginning, made their success possible. It is a remarkable fact that notwithstanding the wonderful success of Prescott's mining interests, they all began in a small way. The locaters and prospectors and developers came here poor men, and by industry, economy and sound business methods created their own capital. During all these years by mining and industrial activity her citizens have never lost interest in the maintenance and advancement of sound religious and moral principles. The denominations represented are the Episcopal, Roman Catholic, Congregational, Baptist, Methodist, Church North, Methodist Church South, African Methodist and Christian Science.

EDUCATIONAL ADVANTAGES. Prescott's educational institutions are everything that can reasonably be desired, and afford every opportunity for obtaining a business or classical education at minimum cost.

Prescott has the finest grammar and high schools in the Territory. Graduates of the latter are accredited to the University of Michigan, University of California, Stanford University and other leading colleges of the country. The people are now preparing to vote upon a bond issue of $25,000 in order to build another grammar school building to be located in West Prescott, the facilities of the present large building being inadequate to properly accommodate the growing attendance. St. Joseph's Academy, conducted by the Sisters of St. Joseph, is a splendidly conducted institution and has over 100 pupils. Another institution of which Prescott citizens are proud, is the Mercy Hospital, it being the best equipped hospital in the Territory.

While justly proud of its industrial, educational and social attainments, Prescott is not satisfied to rest content with conquests achieved, but is on the alert to secure desirable accessions to its population, who will aid still further in building up the material and social possibilities of the city.

PRESCOTT'S NEEDS. Prescott wants and invites men of enterprise, brain and brawn from all parts of the country—the banker, the capitalist, the manufacturer, the professional man and woman, the tradesman and skilled laborer, all to come among us and give us the benefit of their skill and energy, with an assurance that their fortunes and happiness will be augmented by so doing. Prescott wants good men regardless of the section from whence they come, their religious sentiments or political conventions. Prescott needs them in the fields of trade, mining and commerce; in the pulpit, forum and the sanctum. We want them to share with us in gleaning the great resources which kind Providence has placed at our doors. There are unoccupied fields in almost every branch of trade and industry, which promises a rich harvest for whosoever will intelligently develop them.

INDUSTRIES OF PRESCOTT. The city has a modernly equipped electric street railway line, operating through the city and to Fort Whipple the military reservation. Has up-to-date gas and electric light plants.

Local and long distance telephone system.

A splendidly conducted library with a large list of selected and general literature, magazines, periodicals, etc.

Large hardware and general mercantile houses.

Mining supply and machinery houses, shops for repairing and manufacturing.

Ice factory and a modern brewery supply the trade of Prescott and the surrounding territory.

Railroad shops and general offices.

The Elks' Theater, costing $60,000, and an Electric Theater.

Retail and distributing houses of every character and numerous other advantages that add to the attractiveness of the modern and progressive city.

SHEEP RAISING. Sheep raising is perhaps the most important branch of the live stock industry in Yavapai County. Many large bands graze on the mountains during the spring and summer months and gradually make their way to the lower valleys in fall and winter. At numerous convenient points to the railroad sheep are clipped in the early spring and the wool is purchased by eastern buyers at high prices. There is likewise always a demand in excess of the supply for lambs and mutton. Prices range high, and those engaged in the business, as a rule, profit largely. There is ample room for several times the number of sheep at present ranged in this section.

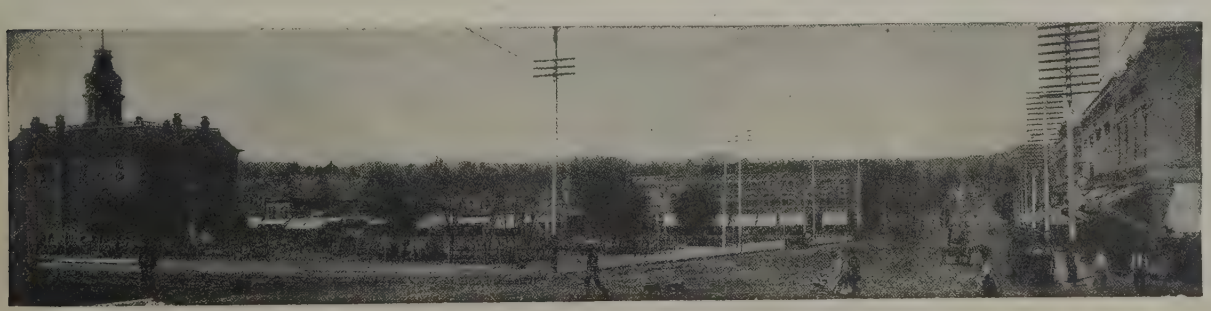
WILLIAMSON VALLEY. This valley is some ten or twelve miles long by three to five miles in width and has an elevation of about 5,000 feet. Hay and the various grains are largely produced, and as there is an abundance of moisture in the soil very little irrigating is found necessary.

In the matter of fruits, this valley is especially adapted to the producing of apples. While no considerable effort has been made in apple culture, yet those grown are excelled by none and find ready market at the top price. The lands here afford splendid openings for the apple grower, the dairyman and the farmer.

KIRKLAND VALLEY. This valley is also tributary to the railroad and to Prescott. It is of large extent, well watered and exceedingly productive. Much attention is given to the raising of hay, cattle and hogs. Fruit culture has also been given some attention with marked success. The peaches are particularly superior, and pears, apples and other fruits grow to large size and are of excellent flavor and coloring. While a number of prosperous farmers and stockmen occupy this valley and have substantial homes, yet there is much of the ground untilled and ample room for several times the present population.

What has been said in regard to the foregoing localities is likewise applicable to the numerous smaller valleys and tracts of tillable land.

Yavapai, the Mother of Counties, with her 7,863 square miles, after having sliced from her territory several other large counties, is still greater in extent than the State of New Jersey, and would make two Connecticuts. The name "Yavapai" means "People of the Hills," and is exceedingly appropriate. The county consists of high table-lands, mountains and hills.



Arizona Leads the World in Mineral Production

Output of Montana, Michigan and Arizona for 1907, with Comparative Statement

By J. W. MILNES

THE output of Montana for 1906 was 300,000,000 pounds. Her rate of increase for six years had been 5 per cent. This under normal conditions would give an output for 1907 of 315,000,000 pounds. The high price of copper furnished an unusual inducement for the first half of 1907 to push her output to the limit, but I figured that she was not quite able to hold her rate of increase, owing to several causes, and produced for the first six months a trifle less than the normal.

All the world knows that the financial panic of the last half of 1907, to the confusion and disaster of which her speculative operators contributed their full and unstinted share, has thrown Montana's great copper industry completely off the track and into the ditch.

My own final estimate of her output for the year was 242,000,000 pounds, but as I felt too much in the dark I thought best to wire for information. I am probably the only newspaper man in Arizona who ever spent a red wiring for copper information. It is cheaper to guess. On December 26, I received from Mr. Ellsworth, the well informed and responsible mining editor of the Butte Daily Miner, who should certainly be the best authority in the camp (and under no temptation to under-estimate the output) and he answered:

"The year's output, Montana, will be 236,750,000 pounds."

How are the mighty fallen!—how are the proud necks bowed! Montana, the opulent and haughty queen of the copper world wipes her weeping eyes with sleeve and passes her crown and scepter up to Arizona!—to poor Arizona, which the people of Los Angeles, where we buy most of our "store goods" are just beginning to realize is "a mineral country of considerable promise" and may some day be "as great as the Bullfrog district." That's because they hear about Bullfrog through their newspapers, and they don't hear about Arizona!

It makes a difference. Yes, it makes a big difference—to Los Angeles.

Modesty is a lovely virtue, but Arizona rather over-plays the gentle emotion. Los Angeles isn't to blame. She'd be tickled to hear it, if Arizona would mention the matter, and her great newspapers would be glad to print the news if sent to them.

Arizona's merchants and bankers ought to get up a public subscription to buy a copy or two of Arizona's New Year's papers to send to their wholesalers and correspondents. On such an occasion Denver would send out 150,000 copies of her local papers.

A personal letter would do the business if our people want to save the cost of a local paper. Most everybody knows that Montana has been "Queen of the Copper World" for a long time, but just modestly mention in your letter that " 'tain't so no more," that Arizona is on the job for the present and will take a try at the crown and scepter act herself for a spell.

Los Angeles will fall off her chair when she hears the surprising news, but a little shock like that won't do her any harm. She's been queen herself for quite a while—queen city of the Pacific, or something of that sort — and she'd be tickled to find she has a "royal cousin right next door that she can drop in on for a friendly gossip of a morning "while the dishwater is heating."

Just say that Arizona's copper output for 1907, in comparison with the late royal Montana's stood:

	Pounds.
Arizona's output	274,000,000
Montana's output	236,750,000
Arizona's excess	37,250,000

That will be enough. Everybody will understand and all will hasten to "send cards" to the new queen and drop in to look over our "crown jewels."

Montana's output of gold and silver is much larger than Arizona's, but as most of those are by-products of her copper there will be a considerable falling-off from last year's output.

Value of Montana's copper output for 1907 (allowing all she claims) will be 236,750,000 x .2126 (the average price of copper for the year)	$50,333,050
All other metals (roughly estimated)	11,500,000
Total value (in round millions)	62,000,000
Arizona's	67,000,000
Arizona's lead	$ 5,000,000

MICHIGAN

The output of Michigan for 1907 is figured on the estimate wired to me on the 27th of December by Horace J. Stevens, of Houghton, Michigan, author of the "Copper Handbook," an annual publication of indispensable value to all who try to understand the copper industry. Mr. Stevens is the highest individual authority in the world on general copper matters. He wired me in response to a telegraphic request for the information as follows:

"My preliminary rough estimate of Michigan's output for the year is 235,000,000 pounds."

Her output for 1906 was 224,000,000 pounds and her rate of increase for the last six years had close to 7 1/3 per cent. This would have made her output 240,000,000 for 1907. I estimated she would hold her pace to the middle of the year under the incentive of high prices, and then just about lost her percentage of increase for the last half of the year—that was the basis of my estimate.

Unlike several of Arizona's big producers, Michigan operators

did not join the curtailment agreement of the Montana producers, and was therefore not so much affected in her normal output as Arizona.

In deference to the high and responsible character of Mr. Stevents as a copper authority on his own district, I abandon my own estimate and adopt his, as stated.

Arizona, 1907, my estimate	274,000,000 lbs.
Michigan, 1907, Mr. Stevens'	235,000,000 lbs.
Arizona's excess	39,000,000 lbs.

Michigan carries (in practical effect) no gold or silver at present depths.

Money value of Michigan's uotput, 235,000,000 x average price for the year, .2126 cents—$49,996,100—or, in round numbers, $50,000,000.

For 50 years Michigan led the world in the production of copper, but lost the lead to Montana, and now the scepter has passed to Arizona. The reason for this is not obscure or doubtful. It doesn't lie in the fact, as the copper jawsmiths preach with an owlish assumption of wisdom, that the Michigan field is approaching exhaustion, which isn't the fact. I have studied that field a little and in my judgment the field is not yet developed to the extent of one-quarter of its probable capacity, and if I get back to the United States 3,000 years from now I expect to find a larger mining population in the Michigan copper field than it holds today.

The secret of Arizon's supremacy lies in the plain, demonstrable fact that the total volume of her copper output is produced at a good deal lower cost than any other field in the world is now able to produce an equal quantity—and Arizona's great "Copper Belt" is not yet developed to the extent of one-tenth of its probable capacity.

ARIZONA

The copper output of Arizona for 1906 was $263,000,000.

The rate of increase for six years has been 18 per cent.

With this rate of increase maintained, her output would have been 310,000,000 pounds for 1907, and with the price of copper higher than it had been for a great many years, there was the strongest incentive to make the output as great as possible. It may fairly be assumed therefore that for the first eight months of the year and before the great fall in price came, that the output was up to the normal rate of increase.

That would give (in round millions) 274,000,000 pounds.

The average price for those eight months was 24,626 cents a pound—in the market the price is carried out to five decimals like that.

The money value of the output for the first eight months therefore was almost fifty-one millions—$50,979,960.

During the panic there was a violent fall in the price of copper and a sharp curtailment in the output, not from strict necessity in Arizona, where the whole volume of the output is produced at a lower cost than can be done anywhere else in the world for an equal quantity, but because of business sympathy with the large producers of Montana.

The curtailment in actual output was probably not so great as many suppose, for while labor was discharged and the ore tonnage largely cut, it is the business policy of copper miners at such times to work their richer reserves.

After consultation with others whose judgment on the situation is valuable it seems to me ample to allow, for all Arizona, 40 per cent from the previous pace as the curtailment, and therefore I assume that the total output for the last four months of the year was, in round numbers, 67,000,000 pounds of finished copper—about 17,000,000 a month.

The average of daily prices for the last four months was .14594 cents.

Value of output, 4 months	$9,778,000.
Total output for the year	274,000,000 lbs.
Total money value	$60,758,000.

But sworn tax statements under the law of Arizona show that the finished copper averages a gold and silver value of .0107 cents to the pound and the total value of these by-products should therefore be $2,931,800

There is also another by-product which is not taxable and the output and value must therefore be estimated—the sulphuric acid produced at Clifton. I estimate the product at 35,000 tons and the value at 20 a ton, a total value of $700,000

The total money value of Arizona's copper-mining industry may therefore be stated as follows:

Finished copper	$60,758,000
Gold and silver, by-products	2,831,800
Sulphuric acid	700,000
Grand total	$64,389,800

All minerals produced independently of copper mining—gold, silver, lead, zinc and quicksilver—may, I think, fairly be lumped at $3,000,000. Arizona's total mineral output for 1907 may therefore be stated in round numbers as $67,000,000

While this is a candid and very careful estimate, calculated with a pretty close knowledge of the general situation, it is an estimate only and in the nature of things no mortal living can either prove it or disprove it at the present moment. It will by 12 months before the Government statistical reports will enable the final corrections to be made—and even they are never perfect, though every effort is made to have them as nearly perfect as possible.

Up to the middle of the year, while things were running in normal order, it was easy to make close estimate on industrial affairs, but the panic has clouded all with uncertainty during the last half of the year.

If I did not expect this statement of estimates to be pretty closely sustained by the final Government statistics of course I should not sign my name to it. I think it will be, and I sign it with confidence.

It is a great event for Arizona. No single event of so general an interest to the Territory is likely to happen till we are admitted to statehood. It is an industrial event of proud achievement that should give our people confidence in themselves and in the incalculable mineral resources of Arizona. I extend a hearty congratulations to all—shake!

COMPARISON

LEADS MONTANA IN COPPER OUTPUT 37,000,000 LBS.; LEADS MICHIGAN IN COPPER OUTPUT 39,000,000 POUNDS.

Leads Montana in total value	$ 5,000,000
Leads Michigan in total value	17,000,000
Leads Colorado in total value	28,000,000
Leads all Alaska in total value	46,000,000
Leads all Nevada in value	55,000,000
Leads Cripple Creek in value	55,000,000
Leads Goldfield in value	57,000,000
Leads Goldfield and Cripple Creek combined	46,000,000

The above estimates have been carefully calculated for the Journal-Miner by the widely known mining writer, Fitz-Mac, author of Fitz-Mac's Arizona Copper Book.

Montana's output, special by wire from Mr. Ellsworth, mining editor of the Butte Miner.

Michigan's by wire from Horace J. Stevens, author of the Copper Handbook.

TEXAS

What Irrigation Has Accomplished at Barstow

In the Pecos Valley of West Texas

By WALKER EVANS

FIFTEEN years ago, the Pecos Valley of West Texas, where the Texas and Pacific Railway crosses the Pecos, and where the Pecos Valley line of the Santa Fe System comes down to connect with the Texas and Pacific at Pecos City, the country was a barren waste.

About that time the Hon. George E. Barstow settled at what is now the thriving town of Barstow, Texas, and went to work to reclaim the surrounding desert land.

Today, seventy miles of main canal and main laterals, and seventy-five miles of sub-laterals, designed and thoroughly constructed to water thirty thousand acres of land, is in full operation. The results are of that marvelous nature which always crowns the successful irrigation project, where bountiful soil and splendid climate need only moisture to make the land productive to a degree, and with a precision which can never be equaled by unirrigated land.

The European Grapes produced near Barstow took the first premium at the St. Louis World's Fair, and the Elberta peaches, cantaloupes, garden truck and alfalfa, raised around Barstow, Texas, have become famous from Texas to New York.

Apples, plums, figs, almonds and similar fruits and nuts are successfully grown at Barstow, and with splendid profit to the grower.

There are scores of acres of the finest kind of orchards and vineyards, and acre after acre of garden truck, alfalfa, grains and cotton—all grown by irrigation.

Many of the growers are willing to testify that they are reaping profits of from $100 to $500 per acre from this land which was so recently considered desert.

The Town of Barstow has a population of 1,000, and there are 1,500 people living outside the town on the prosperous farms which dot the land coming under the Barstow Irrigation Company's canals.

Barstow is the county seat of Ward County, Texas, and has its churches, schools, court house, hotel, local and long distance telephone service, newspaper and fine printing plant, a great variety of stores and a state bank, housed in a handsome stone building, the rock for which came from the local red sandstone quarries.

All this in fifteen years.

Nature has provided a wonderfully productive soil, an ever-flowing river and a climate unsurpassed, with almost endless sunshine, and at an altitude that must give vigor and life to humanity. It remained for George E. Barstow to strike the land with the wand that would bring the needed moisture under perfect control, that a Garden Spot of the Earth might here be created.

Some insight into the character of the man whose comprehensive mind grasped these possibilities when irrigation in our country was in its infancy, and who with skill and patience worked out the details, may be had from his own words about his success.

Mr. Bawstow writes: "Such things may seem easy in the aftermath; but let no one deceive himself as to the patience and fortitude required for the struggle. But for me, after reviewing all its costs, in a number of ways, I am glad of my experience, for the highest reward of labor is found in the success that has wrought something for humanity."

Such are the thoughts today of the man who, from the broad verandas of his home, can view the rich results of his labor as far as his eye can reach.

It was a work, the magnitude of which would have staggered any but a dauntless nature. It has been well done — completed—what now?

From the nature of the man it might be expected that he would share liberally the fruits of his labor with that humanity, the serving of which this great man counts as the greatest of all rewards.

Mr. Barstow is President of the Pecos Valley Land and Irrigation Company of Barstow, Texas.

And under the plan offered by that company, anyone who is earning a living can get a ten acre farm under the Barstow Irrigation System which assures him a good prosperous future, an assured good living for himself and his family for the rest of his days.

Anyone who can save the small sum of $3.00 per week for three years can get ten acres of the finest kind of West Texas irrigated land near Barstow.

The company sells its land under a new, safe and conservative land plan.

The purchasers of a ten acre farm that can be made to produce from $1,000 to $5,000 a year, pays only $15 down and $3 a week for three years.

At the time of the purchase the company places the deed to the land in escrow with the bank at Barstow, and signs a copyrighted contract with the purchaser, setting forth that the bank is to deliver the deed direct to the purchaser whenever the purchaser's receipts show that he has paid a total of $483.

And in orded that the purchaser may not miss the interest from his savings, the company allows 5 per cent interest on all payments made before the delivery of the deed. This means that if the purchaser pays only $15 down and $3 a week for a little over 2¾ years,

he gets possession of land such as his neighbor tills with a profit of from $1,000 to $5,000 per year. And the deferred payments after the passing of the deed are distributed over seven more years at the rate of $39, payable quarterly—every three months—four times a year.

Why should the wage earner struggle with the complicated life problem in the crowded cities of the country, when it is so easy to acquire independence, health and happiness in the ownership of one of these ten acre irrigated farms?

Our cities will always be crowded with those who stick to the hopeless struggle, but blessed are they who, giving heed to the opportunity offered by Mr. Barstow's company, get back to the land—and such land—and to the prosperity, peace and comfort which their industry will here afford.

What Will be the Value of Texas Irrigated Land in 1940?

Governor Campbell gives figures sustaining prophecy of marvelous advances in values:

Some people have marveled that the irrigated lands in Texas should already have reached a value of $100 to $200 per acre; but it is a fact that sales at these prices are already being made.

In answer to the question, "Where will this advance in values end?" Governor Campbell gives some interesting figures:

It is estimated by those in the best position accurately to forecast the increase in population in the United States, that there will be 140,000,000 within our boundaries when the yead 1940 rolls around. This means that there will be approximately twice as many mouths to feed in 1940, as there are today, and naturally this brings up the question, "Where is the agricultural land coming from to grow the crops to feed this tremendous increased population?" The best answer to this question is in the reclaiming of arid lands by irrigation; because it is a well known fact that irrigated lands are made to yield manyfold more than the best unirrigated land.

It is a well known fact that it is taking 100,000,000 acres of land to produce the corn crop alone of this country today. It is estimated that there are only 50,000,000 acres of arid land in the United States, which have been, or can be, reclaimed by irrigation. Twelve million acres of this land is now being most successfully cultivated, leaving only 38,000,000 acres to be reclaimed.

There are about 80,000,000 acres of swamp land which can be reclaimed by drainage, but the land thus reclaimed will not produce any more than other lands in the humid sections.

It is a well-known fact that irrigated land can be made to produce crops than on an average have five times the value of crops raised on unirrigated land. It is an axiom that the value of any given property is based upon the earning power of the property, and it must, therefore follow, as soon as irrigated lands have a little more age, they will be valued at five times the valuation placed upon unirrigated lands.

Unirrigated lands in the Central West are today valued at $150 per acre, and it takes but little figuring to see that irrigated lands will, under normal conditions, in the next few years increase in value to at least as much as $500 an acre.

If we go back to the figures giving the probable increase in population, showing that there will be twice as many mouths to feed in 1940, and nowhere near twice as much land on which to raise the produce, it is quite evident that the law of supply and demand will operate further to increase the value of all land, and particularly of irrigated land, because of its greater productiveness.

Where irrigation has been practiced for a long time, as is the case in Southern California, it is not infrequent that these lands, fully developed into truck farms and fruit orchards, are sold, (when they are sold at all) at prices ranging from $1,000 to $2,000 per acre. That history will thus repeat itself in the Texas irrigated district is, undoubtedly, the conclusion that must be reached if we reason soundly.

Can it be denied that Texas, with her wonderful area must necessarily become the richest state in the Union? I think not.

El Paso, the Growing Metropolis of the Border, Its Advantages of Location as a Commercial Center

OF THE 180,000 acres of rich land that are to be irrigated from the inland sea the Government is creating at Elephant Butte by placing a titanic finger of masonry in the stream flowing through the rock-walled channel of the Rio Grande, 45,000 acres are in the El Paso Valley of Texas and 25,000 in Mexico. In the center of this area that is to be brought into a state of cultivation that will equal the wonderful garden spots of the ancients, is the flourishing border metropolis, El Paso, already becoming one of the most important inland cities of the country, but full of ambition and perfectly willing to enjoy the added prosperity that the productive small farms of this area will bring her. The coming of the Elephant Butte deluge, though, is not going to put the initial bloom on the valley lands below and above El Paso. Already that region is dotted with small farms in the highest state of cultivation, where gardens flourish and flowers perfume the air. Reclamation has been effected by pumping from the heavy subterranean flow that underlies the valley. Some wonderful results have been accomplished by this method of obtaining water. The expense has been far less than one would suppose, owing to the easy lifting that the pumps are called upon to perform. If the Government had never taken up the great irrigation project that is to bring all the land into bearing with a rush, the El Paso region would have gone on progressing steadily under the pumping system. This city is adready surrounded by a prolific agricultural and livestock country, as well as being a great mining center, but the coming of water in great quantity is going to multiply its productiveness many fold and give an opportunity to thousands of industrious settlers.

Scene in Business District

The Elephant Butte Project is of such magnitude that a great city will be built at El Paso. It will be seen that there is opened up to irrigation a region capable of supporting an immense population in affluence and it may be seen, also, that El Paso, as the natural center of all this region, must prosper by the business poured into it, not only by the farming population, but by all the thriving smaller cities that are developing throughout its length.

El Paso is not destined to build upon agriculture, stock raising and mining alone, though these in themselves are sufficient to create a city of great importance at this particular location. It is a commercial center and trade entrepot, to which all the region for hundreds of miles around, including a great slice of Mexico, must contribute.

SEA OF VERDURE AND BLOOM. It is destined to be the great mart and supply depot of the section. Leaving the Las Cruces region and continuing on down the route of the canal system as it approaches El Paso, there is the same tale of productiveness and rich return for the tiller of the soil. The sea of verdure and bloom continues to widen its area as water sweeps about this city of the borderland and its waves roll on down the Rio Grande Valley, clear to the end of the watered region. El Paso draws from the gardens beyond it and is itself environed by a garden as rich as any of them. From East and North and South and West the "caravans" and the railroads bring goods for distribution and trans-shipment over local and distant territory, and this City of the Pass stands as certain of her prestige for all time as was ever any trade mart on earth. With her only competitors hundreds of miles away, she occupies a position that can never be shaken by rivals, her people proclaim.

The story of the Territorial and Texan Southwest will be the story of its natural gateway, El Paso. Here, capital and enterprise will converge and turn the wheels of manufacture, feed the current of business and every productive part of a wide region will contribute to create a splendid city. The mining industry alone would insure an important business center.

The history of El Paso is one of the romances of the development of America's outer lands. It was naturally located in its infancy where the trails from different directions had to converge—the one feasible place for a trading station. The emigrant of the South had to go by this town on his way to California; and all the freights to Mexico that went in over the Santa Fe Trail were taken across the river here. When the iron roads seeking the business of this region destined to give them heavy traffic, built that way, they had to meet at El Paso. As a babe this place controlled the commerce of the region and as a city she will continue to have an absolute grasp upon it.

In 1598 Don Juan de Onate, one of the pioneers of the Spanish conquistadores that took what they coveted of the fairer regions of New Mexico, crossed the Rio Grande, also called the Rio

Bird's-Eye View of City

Bravo, and named the ford and the trail that it led to, Paso Del Norte. A settlement named for the crossing and the pass in the mountains to the north sprung up on the present site of Juarez, missions being established along the route near the middle of the seventeenth century.

A permanent presidio—Spanish military post—was established at the pass in 1680, when the Spanish forces retreated before the attacks of the Pueblo Indians of New Mexico. Recognizing its strategic importance, the United States established a full regiment on the side of the river opposite Juarez after the Mexican War.

There were no buildings on the present site of El Paso until 1827. From that time until the treaty of Guadaloupe Hidalgo, which constituted the Rio Grande the international boundary below Paso Del Norte, that site was a hacienda held under a Mexican grant. At the time of the American-Mexican treaty an American secured possession and a town named Franklin, consisting of a few adobe houses, was born.

The Beginning of El Paso. In 1860 a better effort to establish a town began and the name El Paso came into being. Up to 1880 the inhabitants numbered only a few hundred, however, most of them being Mexicans. Then in 1881 came the railroad. From that date the advance was faster and within the last few years the growth of El Paso has been one of those marvelous developments in the history of the more progressive of American cities.

This brief table of distances shows what a wonderful trade position El Paso holds and how little rivals can do to take away any of her commerce. The nearest points of relative importance are as follows: San Antonio, 623 miles southeast; Fort Worth, 615 miles east; Pueblo, 716 miles north; Los Angeles, 812 miles west; City of Mexico, 1,224 miles south.

The quaint Mexican city of Chihuahua is 224 miles south. It is nearly as large as El Paso. It sends quantities of goods through the American city and buys many supplies there. El Paso also derives revenue from the many tourists and other travelers that pass through here on their way to Mexico and California.

These are the railroads that bring bustle to El Paso: Santa Fe, entering from the north: Galveston, Harrisburg and San Antonio, from the east; Southern Pacific from the Pacific Coast; El Paso and Southwestern, connecting with the Rock Island System at Tucumcari, N. M., by which route through trains are operated between Chicago and Southern California, and extending to Bisbee, Douglas and Nacozari, the great copper camps of Southern Arizona and Sonora, in Mexico, from the northeast; Mexican Central and Sierra Madre lines from the south; the Texas and Pacific from the east.

The 'Frisco will probably extend its system to El Paso soon, and an extension of the Denver and Rio Grande is expected to reach the city ultimately. So important has El Paso become as a railroad center that one of the finest union stations in the country has been erected there. It presents one of the liveliest scenes, with the rush of trains and throngs of people to be seen in all the busy West. A road is being surveyed from Kansas City to El Paso, which will cut the distance 250 miles and the Spreckles Road is building there from San Diego, through Yuma.

All the mining region of the southwest must pay tribute to El Paso, for there is located in that city one large smelter. Ore to be reduced there is shipped from the mines for hundreds of miles around, the railroad facilities being such as to make the city accessible to every important mineral section contiguous to it. Thousands of dollars are thus disbursed in El Paso annually, the smelter employing a large number of men and having a heavy payroll.

The fuel problem threatened to be a continual handicap to El Paso's manufacturing progress until the discovery of oil in large quantities at Beaumont. Since that time the use of fuel oil has been extended in the city and it has been found sufficiently cheap to give a great stimulus to manufacturing. Coal deposits have been discovered in the vicinity and these will be supplying fuel in commercial quantities in time.

Prospects of Oil Discovery. But of far greater importance to the city is the prospect of the discovery of oil in commercial quantities much nearer to it. In the Pecos district, 100 and 200

The Plaza

miles east and northeast of El Paso, including the eastern end of El Paso County, the geological and surface indications of oil, including seepage and oil strata struck in boring water wells, indicate great petroleum deposits there. Should large flows of oil be discovered this close, the manufacturing advance of El Paso would be tremendous.

While on the subject of fuel and manufacturing the smelting industry should be given more attention. One large smelter employs from 600 to 800 men and has a payroll of from $40,000 to $50,000 a month. This company, in addition to paying out this money for labor, which helps swell the business of the city's retail merchants, makes a much more important distribution of coin. It pays to shippers of minerals from the tributary country $800,000 to $1,000,000 a month. The ore shippers make El Paso their headquarters. From a mine 600 miles away, in Sonora, Mexico, $1,000,000 worth of ore was shipped in one year to this concern. It receives ores from New Mexico, Arizona, and West Texas and the Mexican states of Sonora, Chihuahua, Sinaloa, Durango, Coahuila and Lower California.

There are foundries and machine shops in El Paso that are employed almost entirely in the production of machinery and material for the mining and other industries of the region.

Wherever there is a region that is prolific in agriculture and at the same time is surrounded by a rich mineral producing section, there exists a combination, which, of itself, is certain to produce an important city. The mining towns need the products of the soil and the growers need the markets created by mines and the cash that is exchanged for farm products. The wholesale houses do their most extensive business with the mining settlements that are brought in close communication by the eight railroads. These railroads find their heaviest traffic in the carrying of ores, coal and supplies, including heavy machinery.

There will always be opportunity for the manufacture of lines of goods and articles for which the raw material can be procured cheaply. Cotton growing may become an important industry in the irrigated regions and the manufacture of cotton fabrics may be undertaken when the fuel problem is entirely solved.

Vast beds of coal and mountains of iron ore are yet to be developed in the vicinity of El Paso and these will bring extensive iron and steel works. Gold, silver, lead and copper are at present the chief mineral products. More smelting works and more manufacturing plants of various kinds will come with the development of the mineral resources of the region.

Railroad Brings Development. Since that first railroad, searching out, as railroads have a habit of doing, a territory that promises remunerative business, stretched its steel length through this portal between the two Republics in 1881, the census and financial figures of the city's growth have served to draw many investors to it. The man with money to venture is prone to be impressed with bank statistics in growing communities. They are the book from which he reads his lesson of investment. As a matter of fact the greatest portion of the city's advance has been in the last five years. Figures of two periods — ten years apart are given. In 1895 the aggregate capital of the banks was $155,000 and their deposits $856,054.95. In 1905 the capital was $750,000 and the deposits $4,886,181.15. In 1900 the schools had thirty teachers and 2,071 pupils. The school property valuation was $70,000. In 1905 there were eighty-eight teachers and 4,228 children and the property was valued at $371,000. Business property sold in 1900 at $400 a front foot. In 1907 it was worth $1,200 a front foot.

Today, 40 per cent can be added with safety to everything that could have been said about El Paso's population, finances, resources, trade and property values in 1905. This, the Keystone City of the Southwest, as she is beginning to be known, grows rapidly. It is in such a place that investments increase rapidly, that the man who embarks in business or buys city realty swells his capital the fastest. El Paso is full of opportunities. Its business men say that no man ever came from another place that he wasn't impressed enough to remain or make some purchase of land and leave it to rise in value.

Corn as Raised on Felix Martinez's Farm, El Paso Valley

Prophecy of Von Humboldt. The Secretary of the El Paso Chamber of Commerce, in writing of that city quoted Baron Von Humboldt, who wrote long ago, "Somewhere on the border of Mexico, in the United States, a great city will spring up." Continuing, the Secretary, who has recalled this prophecy, says:

"El Paso is situated at the only point along the whole boundary line between the Gulf of Mexico and the Pacific where the natural conditions permit the building of a great city. At no other point is a concentration of railroads possible. No other point possesses one-tenth the natural resources of El Paso and the tributary country. The whole history of the Southwest since Onate crossed the Rio Grande at the 'North Pass' proves this point has not, and can not have a rival for industrial and commercial supremacy in the great district of which it is the geographical center.

"It was inevitable that trans-continental and local lines of railroad from all directions should come together at this place.

"El Paso's growth and prosperity up to the present time and its promise of continued growth and prosperity rest upon the variety and extent of its resources and elements of strength. No city in the country is more richly endowed by nature.

El Paso has incalculable and inexhaustible mineral wealth. It is surrounded by fertile lands that richly reward labor expended in agriculture and horticulture. Tributary to it are extensive tracts of valuable grazing lands. It is not far removed from immense forests of pine. It has vast deposits of excellent coal, within easy distance. It has a climate unexcelled in any part of the world and equaled in but few other localities. It has a position that makes it an important military strategic point. Its geographical position and the configuration of the surrounding country insure its future as one of the chief railroad and commercial centers of the United States.

"As a place for investment in realty, whether business or residence property, El Paso offers uncommonly profitable openings. Notwithstanding the continued activity in building for the last five years, every desirable residence or business house is in quick demand as soon as completed or vacated. Desirable business and residence property has advanced in market value during the last three or four years from 50 to 200 per cent, and yields 10 to 18 per cent net, on the investment. Opportunities for investment in mining properties and manufacturing enterprises are unlimited.

"Good judges say that the country about El Paso is today the best undeveloped mineral region left on the continent. Mining properties in all stages of development, from the shallow prospect, as yet only a chance, to the mine paying its hundreds of thousands of dollars in annual dividends, await the coming of the investor. The prospect can be purchased for a few hundred or a few thousand dollars, while for the best mines, where they are for sale, the price runs into the millions."

A Fine Place to Live. Skilled mechanics receive higher wages in El Paso than in the eastern states. Like all growing places where money is more plentiful and wages greater than elsewhere, some articles are of higher price. This is a feature of all places where money is made the easiest. Yet living is as cheap as anywhere else on an average, and in many respects a great deal more comfort can be obtained with less money than in "cheaper" communities. The tourist and homeseeker will find everything favorable and delightful. Good furnished rooms may be had for from $10 to $15 a month and good board in private families costs from $3,50 to $7.00 a week. There is here as a gastronomic novelty and a delight to those who like it, the Mexican cooking. Many of the Mexican dishes become great favorites with the Americans. Here you can obtain a real tamale, that shows you that the "near-Mexican" article produced in many cities further away from the land of manana is far from the genuine in construction and flavor. A chicken cooked in the Spanish style is a dish that makes a feast. The homely tortilla and red bean are viands of relish under Mexican methods and many a "good feeder" does not disdain them at table.

For agricultural and other enterprises not requiring trained craftsmen El Paso has cheaper labor in her Mexican population, with a reserve supply ready to pour over the border when there is a demand for any unusual number of men. This is fairly intelligent and efficient unskilled labor and is available for manufacturing.

Men with money to install plants can find large profits now in canneries for meat, fruits and vegetables, factories for the production of leather goods, especially boots and shoes; a cracker factory, beet sugar mill, factory for furniture and other household goods, cotton and woolen mills and numerous other industries. An important industry to the commerce of the city is already under way, the Southwestern Portland Cement Company, incorporated for $2,200,000, is now under construction. They have acquired the Courcheme cement tract, 900 acres in extent, and will have a capacity of 1,400 barrels per day, employing 150 men, and with the latest and most improved cement machinery. A new brick plant, making the sand-lime brick, with a capacity of 50,000 per day, has also recently been completed and is now in operation.

Quince Culture, Felix Martinez's Farm, El Paso Valley

One of the leading car wheel manufacturers is also figuring on establishing a branch here.

So great is the tide of traffic that pours from Mexico through El Paso that it is the eleventh city of entry for imports in the United States. A heavy tide of goods passes in both directions through the custom houses of El Paso and Juarez. Among the chief articles of import are ores and bullion, cattle, hides, tropical fruits and other Mexican products. The leading exports are manufactured goods, machinery leading. The growth of the trade is extending the variety of goods exchanged each year.

As El Paso is the metropolis of all the great section that is draws from, extending for a radius of nearly 1,000 miles around it, the men of wealth and

enterprise all over that section make it their home or headquarters. Cattlemen and mining men especially, and wealthy farmers, build fine residences in this city and establish their families there to reap the social and educational benefits and the conveniences and pleasures of city life. There are all the usual amusements found in a progressive place that has taken its position among the important cities of a nation, including the theater and the opera. There are fine holtels in El Paso and elegantly equipped men's clubs. The usual pastimes of tennis, golf, automobiling and driving are engaged in. Then there is the carnival, and at Juarez, the bull fights.

Beautiful Public Buildings. El Paso has beautiful public buildings that at once give the visitor a good impression of the city and its residents. The Federal building is a handsome edifice. There are magnificently fitted stores and banks and luxuriously appointed hotels. In fact, all the finish and style found in much larger cities nearer centers of population characterize El Paso. There are quaint old samples of Spanish architecture and old-time gardens that please the eye. It was her standing as a port of entry that gave

El Paso such a fine government building so early in her new career. All the public school buildings are handsome edifices and the new high school structure is very pretentious, being one of the prettiest to be found anywhere.

El Paso is not a frame city, but is substantially constructed of brick, with stone used as trimmings. There is plenty of lumber within 100 miles of the city and large lumber yards in El Paso, but brick seems to be the material that the climatic conditions make the most desirable. Hand or machine made brick cost only $7.00 delivered and pressed brick $9.50 and upward per thousand. Common pine lumber retails for from $25 to $30 a thousand and finishing lumber for $40. There are several banks of first quality clay near the city and several plants turn out millions of brick annually. Local demand keeps up with the products of these plants, though there is a market for the brick in other growing towns.

The reasonable price of the more important building materials has had much to do with the rapid growth of El Paso. It is estimated that 50 per cent of the people there own their own homes, which shows a gratifying degree of prosperity, considering the fact that only 10 per cent of the people of eastern cities are as fortunate. The homes of the El Paso people are handsomely finished on the interior and surrounded with pretty grounds, containing semi-tropic foliage.

Some of the leading fraternal orders have handsome buildings, the Masonic Temple being an especially pretentious lodge structure. There are also handsome sanitariums.

Mexico Lends Its Charms. The contrast presented by the old Mexican city of Juarez, across the river, still old, because it has not been born again, is striking. The Mexican city has acquired modern buildings, but the adobe still predominates overwhelmingly and the narrow streets are lined with those squat structures, the doors opening directly on the streets and the windows laced with iron bars. But there is the old Mission Church—centuries old—standing on the brow of a hill and adding picturesqueness to the scene. The custom house and the jail rise to greater heights than the average adobe, too, but there is not much to take away the old-time Mexican aspect. Juarez is a foil for the more modern El Paso and is as necessary to it as a museum to a fair. In this quaint place across the river, with the hand of century-dead builders upon it, the tourist in the American city finds delight and the American city need lose no prestige in its general new appearance by having this sight of the old for the visitor. Then there are the famous bull fights, which would be prohibited in American territory, but which El Paso can advertise almost as her own device for the amusement of her guests. There are the Mexican shops and the picturesque Indians, and the Mexicans themselves in the old city over the Rio Grande, the pretty senoritas in their mantillas and the soft voice of the guitar in the cool evenings within the patios.

For a long time the patient mule dragged the few street cars that El Paso had, but the grand awakening blew the mule clear off the track as if a charge of dynamite had been set off under him. Four years ago one of the finest electric trolley systems in America, covering the whole city was installed. It brought a great wave of activity with it and the mule shed tears as he gazed and realized how very little of a potentiality he was in the building of modern cities. Suburban residence tracts have opened up under the impetus of the rapid transit and many handsome villa homes are coming into existence.

Of course there are plenty of churches in El Paso. The zealous religious element is always at the front in the building up of prosperous communities and Christianity has not been behind with its excellent work in this city. The houses of worship are elegant and many and give El Paso foremost ranks as a Christian community.

There is the best of fire and police protection, without which no city could be modern or a desirable place of residence. Built of brick, though, there is little danger of El Paso ever suffering the ravages of a conflagration.

Fort Bliss, where the Government has quarters for eight regiments, is five miles northeast of El Paso.

Enchanting Resorts in Mountains. And then there is the heaven-reaching summer resort, Cloudcroft. It is in the Sacramento Mountains, at an elevation of 9,000 feet and 112 miles northeast of El Paso. You go there by train, the last section of the ride being over a wonderfully constructed mountain railway from Alamogordo, away up at the head of the valley, beyond Rincon and Las Cruces. It is cool and delightful up there during the hottest months. The scenery along the route is picturesque and grand. The mountains are covered with a dense growth of pine, spruce and other timber and there are ferns and wild grasses and cold water that cascades down the mountain sides. People throughout the whole Rio Grande Valley go there for the camping season. There are hotel accommodations at Cloudcroft. This resort is nicknamed the "Roof Garden of the Southwest."

From the Sacramento Mountains may be seen that wonder of nature, the granulated gypsum desert, covering 250 square miles between the Sacramento and the San Andreas Mountains—a dazzling white waste with dunes and hills, giving the appearance of sea surf.

El Paso County covers 9,750 square miles or 6,240,000 acres, being larger than the State of Massachusetts. It has a frontage of 147 miles on the Rio Grande. This area contains mountains, valleys, plains and table-lands, or mesas. The soil is equally diversified,

ranging from the barren, rocky mountains, gravel and sandy plains to the rich alluvial lands of the Rio Grande Valley, where, in the midst of all the surrounding waste, lie fertile farms for so many. In topography, soil, climate and natural resources, El Paso County must be ranked with New Mexico, rather than with Eastern Texas.

The lands contiguous to El Paso that the water from the Elephant Butte Project will cover are similar in fertility and products to those of the Mesilla Valley about Rincon and Las Cruces. In fact, all of the territory covered by the Elephant Butte Project is within the natural trade domain of El Paso, the metropolis of the region. Unimproved agricultural lands in the Rio Grande Valley immediately above El Paso, which section is known as the El Paso Valley, and beyond the city to Fort Quitman, where the project ends, may be bought for from $10 to $25 per acre and improved lands for from $20 to $100 per acre, except where planted to orchards and vineyards. The returns will be equal to those of the Mesilla Valley. The farmers need not wait for the coming of the water from the Government system. Water is already obtained through canals from the Rio Grande and by pumping. An eight

horse-power gasoline engine and pump will irrigate from forty to sixty acres of orchard and vineyard.

The New Mexico Agricultural College and Government Experiment Station, so useful to the Mesilla Valley farmers, are only forty miles above El Paso and the benefits of its experiments are also within the reach of the growers about the Texan city. The college bulletins containing the results of the scientific experiments, that search out the quickest way to wealth for the farmer, are mailed free.

Small Farm Brings Independence. The man who is putting up with the discomforts and hardships and perhaps meager existence of a colder climate should look into the opportunity that lies in the Rio Grande Valley. If from forty acres of land he can raise crops that will give him ownership of that land and a free water right in a few years, besides money in bank and a good living all that time for a large family, it looks as if it would certainly be well for him to remove to this "land of sunshine," join in its advance and partake of its prosperity. It is something to feel the full glow of health that the outdoors and an equable climate bring and something more still to acquire a competency in a pleasant land where the toil necessary to acquire it does not bring age before it can be enjoyed. The people of El Paso ask that you at least investigate and then decide for yourself. They say they do not fear the result of a most thorough investigation, being in this respect like the other places that feel they have good home opportunities to offer.

The soil of what is known as the "Lower Valley," lying directly below El Paso, is a black, sandy loam, going down from five to twenty feet. Under this is a stratum of sand, ten to fifteen feet in depth, then a gravel formation. Through this gravel flows an inexhaustible stream of pure water. It is this that is pumped upon the lands where ditches have not been dug.

It is probably that only one-half of this rich region has been brought under cultivation. There are farms to be had by those who will come for them.

Grape growing has proved a success in the lower valley. The soil has been found to be of the best for varieties of grapes that produce fine wines. The yield is prolific and the flavor as true as the wines of France. The making of wine will some day be a great industry in this valley.

There is little use going through the long list of products that the rich lands in this valley will grow in prodigal profusion with water and cultivation. Heavily producing farms so close to a growing city are always money makers.

What the El Paso people want you to remember is that there is land for you and that your prosperity and that of the city are linked. Lands that you secure for from $10 to $20 an acre are worth from $50 to $150 after ordinary improvement and watering. There is no difference in the productiveness of the land. It is all a matter of location.

Many Letters of Inquiry. Thousands of letters of inquiry about these lands and the City of El Paso are coming in daily. It is the desire to give the fullest information, and all questions are answered.

El Paso in Texas, and Rincon and Las Cruces in New Mexico maintain active Chambers of Commerce and inquiries made of any of these chambers will receive prompt reply.

The officers of the Board of Governors of the El Paso Water Users' Association, formed in compliance with the Government regulations, are A. Courchesne, President; J. W. Magoffin, Vice-President; Felix Martinez, Chairman Executive Committee, and G. W. Huffman, Treasurer. Other members of the Board are J. A. Smith, H. B. Stevens, C. O. Coffin, Z. T. White, Royal Jackman, D. E. Doane and G. N. Garcia.

Intending settlers under the Elephant Butte Project throughout the Rio Grande Valley should read the story of the Nile Delta. The same fertility that exists in the valley of this great river exists in the Valley of the Rio Grande. This river that rises in the snow fields of the Rockies and gathers up enriching particles on all its long whirl to the home lands of New Mexico, Texas and Mexico, fertilizes those lands every year so that they are kept in the highest state of production without expense to the farmers. The benevolent river not only gives its waters to the land, but spreads over them the necessary plant food as well.

There is no farmer now in the Rio Grande Valley who would return to the place he left to go there, no matter that that place might be deemed one also favored by nature.

El Paso County is building 54 miles of macadamized roads to connect the farming districts with the city; these roads will cost over $300,000.

El Paso lies in the heart of the Rio Grande Valley, the richest in the world, and the U. S. Government intends to expend $8,200,000 on a dam which will have a capacity of 650,000,000,000 gallons of water, with which this rich valley will be irrigated.

El Paso has just voted bonds to the amount of $500,000 for public improvements; of this sum $200,000 will be invested in extending the street paving; $100,000 will be invested in street grading and drainage; $100,000 will be invested in new school buildings and sites; $50,000 will be invested in a modern garbage incinery, plant, and $50,000 will be invested in a septic tank system for sewage disposal, to supplement El Paso's $500,000 system of sanitary sewerage.

EL PASO IN A NUTSHELL.

El Paso has seven parks.
El Paso has four hospitals.
El Paso is a city of homes.
El Paso has eight railroads.
El Paso has a large brewery.
El Paso has 5,000 telephones.
El Paso has five lumber yards.
El Paso has 45,000 population.
El Paso has 125 wholesale houses.
El Paso has a Country Club house.
El Paso has three business schools.
El Paso has several private schools.
El Paso has a Progress Club home.
El Paso has 6,500 school population.
El Paso has an altitude of 3,762 feet.
El Paso has a $400,000 union station.
El Paso has 45 churches and missions.
El Paso has several Catholic academies.
El Paso has an area of 10 square miles.
El Paso has a $200,000 Masnic Temple.
El Paso has 30 miles of electric railway.
El Paso has a $100,000 Elks' Club house.
El Paso is the natural gateway to Mexico.
El Paso has 160 competent school teachers.
El Paso has all fraternal orders represented.
El Paso has post office receipts of $150,000.
El Paso has property values of $50,000,000.
El Paso is the Queen City of the Southwest.
El Paso has a $125,000 Y. M. C. A. building.
El Paso has a U. S. military post (Fort Bliss).
El Paso is the best lighted city in the Southwest.
El Paso has 40 hotels and large rooming houses.
El Paso has a military academy, costing $65,000.
El Paso has 11 public schools valued at $700,000.
El Paso has a well equipped home-like sanitarium.
El Paso has two large theaters and several small ones.
El Paso has the first steel converter in the Southwest.
El Paso has two Trust company and Savings banks.
El Paso has the most healthful climate in the world.
El Paso has six bridges spanning the Rio Grande River.
El Paso has a public library containing 10,000 volumes.
El Paso has 50 blocks of paved streets costing $250,000.
El Paso has five National banks, resources of $9,000,000.
El Paso is the greatest distributing point in the Southwest.
El Paso has a number of growing manufacturing establishments.
El Paso has three daily newspapers, members of the Associated Press.

El Paso has a summer resort 100 miles distant, at an elevation of 9,000 feet.

El Paso has six brick plants manufacturing common, pressed and lime-sand brick.

El Paso County borders on New Mexico for over 150 miles from the east and west line.

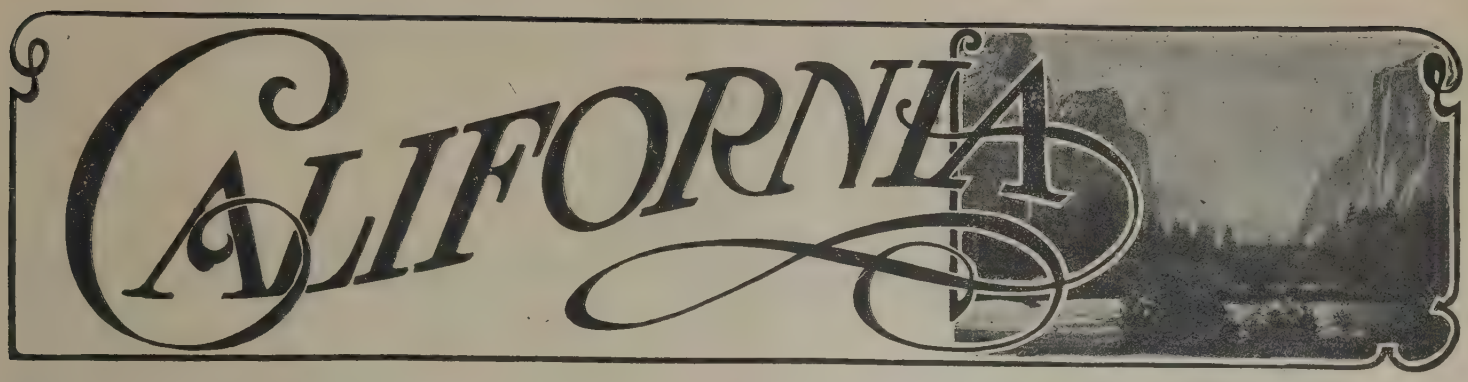
El Paso has a tax rate for city, state and county of 2.55 per cent on a 50 per cent valuation.

El Paso has three foundries manufacturing all kinds of mining machinery, castings and brass.

El Paso is the principal U. S. Customs port on the Mexican border and ranks 11th in importance in the U. S.

El Paso has a payroll among the smelters and mining companies within 200 miles of $2,300,000 per month.

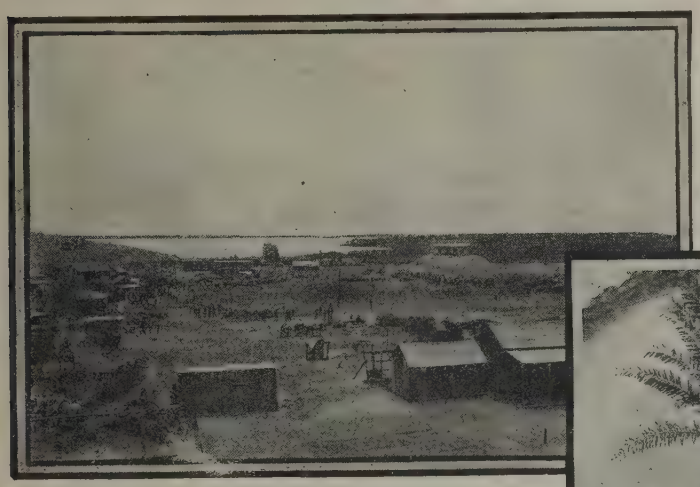
El Paso is the biggest city, in the biggest county, in the biggest Congressional District, in the biggest state, in the biggest Nation on earth.



Wonderful Results of The Yuma Project

Waters of the Colorado Turning Desert into Most Productive Part of the Earth

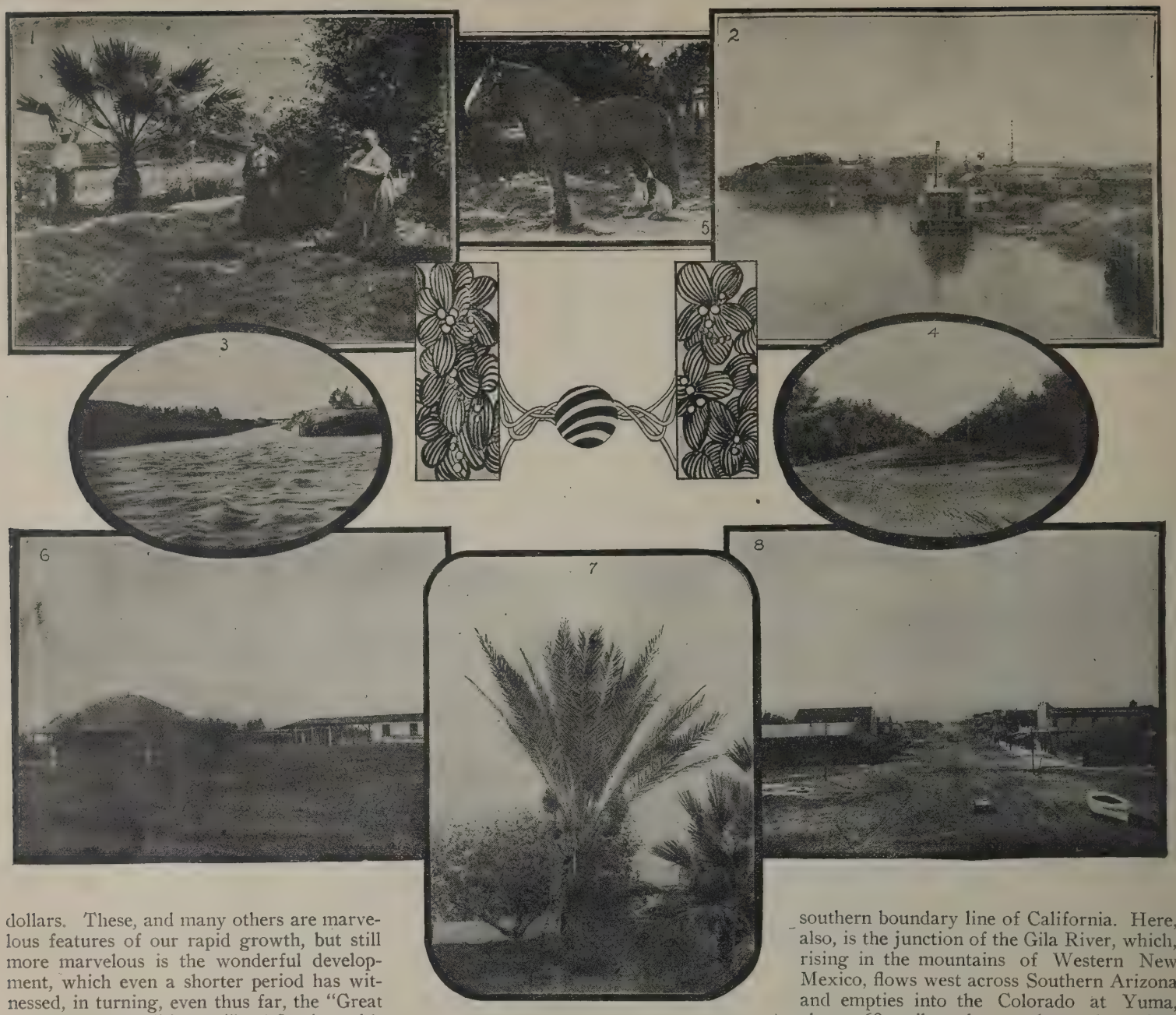
THE passing of the Reclamation Act was one of the most practical, far-reaching and wisest — indeed, one of the greatest enactments of the United States Congress. If anyone, even not included among the great majority of citizens of this country who as yet have not given the matter any consideration and have no knowledge concerning it, save the mere fact of the enactment of such a measure, now doubts the above statement, or deem it too enthusiastically broad and strong for the facts, let them investigate, study its possibilities and reflect upon its practical workings as thus far demonstrated, and then let them simply watch and wait only a few years, and they will say: "The half has not been told me! I had no idea of what the Act really was! That statement was true and just!"



It is not strange that even those who do have the usual glimmering, distant knowledge of the passing of such a bill, and a condensed idea of its provisions, should not comprehend what it really is. For, while it is not natural for the average busy citizen to devote time to study and investigation, and then give the energies of his mind to the necessary imagination and comparison to enable him to see with the eye of faith and comprehend the possibilities of the Reclamation Act, it is almost impossible for him to do so. Indeed, it is doubtful if the far-seeing, patriotic men who thought out that bill, together with those who fought for its passage through both houses of Congress, comprehended its full bearing upon this Nation and its people in both its near and distant future. The more one studies and thinks of that Act, of the conditions it is designed to effect, and of the full and far-reaching possibilities of all of its provisions, the more the patriotic, philantropic citizen is "lost in wonder, love and praise" for that Enactment and for the men in whose hearts and brains it had its origin.

If the National Irrigation Congress should, in all the future, never accomplish anything more; if the coming Sixteenth Annual Session should be its last, and if it should be that it should quietly turn from its meetings in Albuquerque this fall into disorganization and into its grave, yet it could not die; the work it has done, living on through the ages in the continuous development of the provisions of the Reclamation Act, and in the marvelous benefits and glorious changes in the American Continent and its people which it will have wrought, would have rendered its name immortal and its memory ever honored. But it is not going to die! the Congress does not stop to rest on the usefulness and honor it has achieved, nor to receive praise, nor to even ask credit for what it has thus far accomplished. It has still a great work to do, and is going steadily on to do it, as development will show.

Think of how people yet in middle life in their schooldays used to recite in their geography lessons: "The Great Deserts of the world are two in number; one, the Great Sahara, lying in Northern Africa, and the other, the Great American, lying in the southwest portion of the United States!" What would the world have said, at that time, about the man who had then prophesied the changes the next forty years would witness in that "Great American Desert" country? There are many wondrous features concerning the development of our country during those forty years, but the most wonderful, is not the fact that within that time our population has far more than doubled, not is it that within that period our total wealth as a Nation has increased from thirty and a half billions of dollars to almost one hundred billion, nor is it the fact that those same years have seen our manufacturing establishments more than double in number, while the total value of their products have increased from about four and a quarter billions of dollars to a little over thirteen and a half billions of



dollars. These, and many others are marvelous features of our rapid growth, but still more marvelous is the wonderful development, which even a shorter period has witnessed, in turning, even thus far, the "Great American Desert," into a "land flowing with milk and honey," and making it, to the extent that it has "The Desert" which "shall bloom as the rose." And the work has but merely been begun, for the feature of the Act providing the "revolving fund" renders the service of the Government continuous, until all its barren lands which irrigation can make productive shall be under cultivation.

At the Mouth of the Mighty Colorado. While Northern Africa has only four, the Nile and the Senegal Niger and Volta Rivers, and they on the extreme eastern and southern edges of its Sahara, the United States has its Colorado and its Rio Grande, its Arkansas, its Platte, Pecos, Republican, Canadian, and its Gila and San Joaquin Rivers, nine in all, besides all their numerous tributaries, running through the very centers and through all the outer portions of the Great American Desert; especially through the centers are the first five named. Added to the possibilities of irrigation afforded by these rivers and their branches, are those furnished by the extensive underflow in some parts and by artesian wells in others, and the feasibility of removing via the Reclamation Service, from the face of the earth the entire American Desert is realized.

Down near the mouth of the Colorado River, in the southwest corner of Arizona, about 60 miles north of the Mexico - Texas boundary line and about 30 miles north of the line between Arizona and Texas, is the town of Yuma, Arizona, situated on the eastern shore of the Colorado River, which constitutes the dividing line between that Territory and California, and exactly opposite the southern boundary line of California. Here, also, is the junction of the Gila River, which, rising in the mountains of Western New Mexico, flows west across Southern Arizona and empties into the Colorado at Yuma, about 60 miles above where that river empties into the Gulf of Colorado. The Colorado, with its headwaters in the sources of both the Green River, rising in the mountains of Northwest Wyoming, and in the Grand River, rising in Northern Colorado, from the junction of which streams in Southeastern Utah it bears the name of Colorado is as a whole the stream of most varying and peculiar and wonderful characteristics of any in the United States. Of the most wildly beautiful and delightful scenery, to fisherman, hunter and camper, or excursionists and pleasure seeker, for all along its upper half; then from the junction—where the name properly begins—for from 150 to 200 miles cutting through gorges and canyons of black and unmeasured depths, or winding through apparently the dry bottom of a great ocean studded with peaks sky-piercing above all surrounding heights, and seamed by still deeper and darker chasms, and all bordered by o'er-hanging cliffs or chains of sloping mountains, it makes the wildest, most bewildering, grandest yet most terrible choas of marvelous scenery known on the American Continent; then from the lower end of this "Grand Canyon," at a point on the Arizona boundary and in the extreme southeastern point of Nevada, named from two isolated mountain peaks, "The Needles," the famous river flows lazily for 150 miles to the California Gulf through what was originally the dreariest, most desolate, most isolated and barren part of what composed the Great American Desert.

The Diversion Dam at Laguna and Its Peculiarities. Here, at Yuma, the Government has one of its principal irrigation pro-

jects in course of construction, working rapidly toward completion.

The undertaking at Yuma, on account of the topography—or "lay of the land"—was of a very different nature than that at any other of the points of the Services' selection. In its broad sweep to the Gulf the river had formed only a shallow, and comparatively narrow valley, but up and back from its shores lies a great, wide level, or mesa, extending on both sides of the river and all along its length. Moreover, here in the last stretch of the great river, so large is the regular volume of its flow, and so sure and steady and regular is that volume from its vast watershed among the mountains in the center of the Continent, that there was no question of storage; no need of preparing to impound and hold for future use, as in other projects.

Therefore, the engineers reported the plan of simply providing whereby a system of canals should be constructed to carry the water of the river abroad over these great mesas, and whereby the water could be diverted from the river channel into such canals. Hence, a huge diversion dam was decided upon, to be erected about 10 miles above Yuma, across the Colorado, at a point called Laguna—which explains why it is so often called the Laguna Dam in the newspaper.

The total length of the dam will be 4,780 feet. It will have a width of 275 feet while its height will be 19 feet. Work was commenced on it in July, 1905. Every feature is constructed with the object of durability and stability. Every portion of the weir and headworks is of rock, concrete or steel and rests upon sheet piling driven into the river bed entirely below the water to prevent decay. The weir consists of a loose rock structure, with paving stones one and a half feet in thickness, on the down-stream slope, the structure being tied together with three parallel walls of steel and concrete running longitudinally between the granite abutments, on the river sides, and the entire structure being made further secure by an apron of loose rock, being 10 feet in thickness and 50 feet in width, at the lower toe of the dam below the sloping pavement. The height of the weir is to be 10 feet above low water mark, and the slope of the down-stream side is 12 feet horizontal to one foot vertical, with a 50 foot apron below.

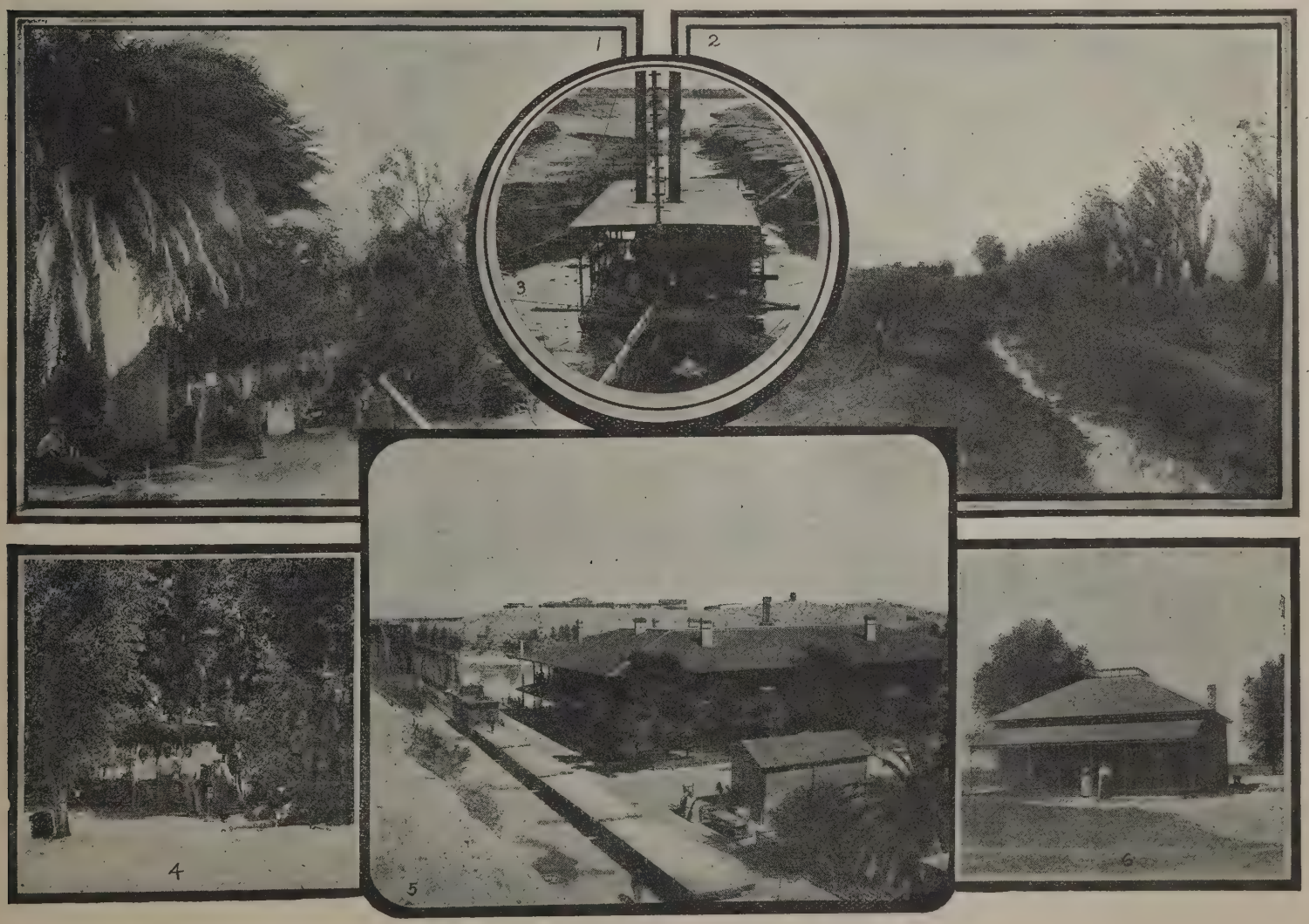
Great Canals on Both Sides of River. Siphon and Conduit. Beginning from the dam the great canals will extend, one on the Arizona side will carry water to all the bottom lands, which are here mesas, on the east side of the Colorado, and on the Gila River, between the dam and the Mexican boundary. On the California side that portion of the Yuma Indian Reservation lying suitably will be supplied.

The capacity of these canals at their intake will be, on the Arizona side, 1,300 cubic feet per second, and on the California side 200 cubic feet per second. They are so constructed in smoothness of sides and bottoms as to afford, and thus prevent a greater veliocity throughout than usual, and thus prevent loss by seepage and evaporation. The gates and drops, as well as the bridges and crossings, are built of steel and concrete.

Since the Arizona Canal traverses the land both north and south of the Gila River, some method of crossing that stream was necessary and this was met with the construction of an inverted siphon. This Siphon will consist of three re-enforced concrete pipes, each 10 feet and six inches in diameter, and will have the same capacity as the canal. These pipes will circle from each end at the surface to a depth entirely below the bed of the Gila.

A conduit will carry the Arizona canal through the City of Yuma. This will be built of re-enforced concrete and will have the same capacity as the canal. It will be in horse-shoe shape, the width and height being both 10 feet and six inches, and it will be an inverted siphon in part, with a tunnel section at each end and with paved approaches.

Freeing the Water of Silt by Means of Great Settling Basins. Like the River Nile the Colorado bears in its waters a vast amount of sediment or silt. In its rapid and furious course through the mountains for two-thirds of the way from the British possessions, it is tearing loose and grinding up whatever it finds in bank or bottom, and still grinding fine, bears it along in its current. Also as it flows through the plains from where it strikes them at the mountains' edge, at "The Needles" above mentioned, on to the site of this dam, it is continually sweeping in more and more sediment,



until at Yuma it is called by one "A huge stream of unsweetened molasses."

This silt formed a very serious question for the engineer to handle, since unless otherwise provided for, it would be only a few years ere reservoirs, canals and ditches would be filled level with the surrounding surface and the undertaking a failure.

Hence, the plan adopted; viz: By the extreme length of the dam, in consideration with the slight fall of the stream, and the width of the basin above it, would form a vast settling basin; it being a fact that the silt always moves along with the river, not at the top of the water but mostly in the water below mid-depth, and when the current is check it gradually settles to the bottom.

Thus, by adjusting the gates, or intake of the canals, accordingly, the water filling the canals can be drawn from the upper portion of the reservoir, or from that near the surface of the settling basin, thereby using the clearer water from which the silt has settled. Hence these intakes are so constructed that the full capacity of the canals can be served and not draw over one foot of water from the surface of the river or settling basin.

Then, additional means of clarifying the water are supplied by making the first 3,000 feet of each canal of such dimension as to form other settling basins. These sections are to be of such size that the movement of the water through them will not be at a rate of over one foot per second,and are to be well paved. At the lower end of these sections gates will be so constructed that at proper intervals the entire body of the canal's contents can be rapidly washed back into the river, drawing water from the reservoir above their intakes with which to clean them out.

Great Levees Necessary to Control Boundary of the Colorado. Building levees is a part of the work of the Reclamation Service here. Because of the great floods which roll down the Colorado at this point, and because, like the Mississippi, the river has built up its bed by means of this silt, so that it flows in a sort of natural aqueduct, along the whole distance from Yuma to the sea, it is necessary to construct a great levee on each side of it, as far as the National boundary in California and in Arizona, which is some thirty miles farther down the river.

These levees are built after those constructed by the Government along the Mississippi. The earth works will have a slope of three feet horizontal to one foot vertical on the land side. They will be eight feet wide at the top and their height will be five feet above high-water mark. They will be 400 feet apart, on the Colorado, and 3,200 feet apart on the Gila, for the shorter distance they will be needed on that stream.

Lands Richer Than Needed. Necessary to Keep Off Fertilizer. It is a fact that these lands are so very rich that not only is no fertilizer needed, but the Government is making all this effort to keep it off. For this silt which thus flows down the Colorado has been measured and analyzed for some years by the Government Agricultural Experiment Stations, and by the Reclamation Service, and it is shown that ninety millions of tons of it are carried down by the Colorado each year, and that it contains large amounts of potash, phosphoric acid and nitrogen.

The value of the nitrogen alone, at the price paid for it by manufacturers of commercial fertilizers, would be $1.25 per acre foot, of $5 per four acre feet, the amount used yearly in irrigating a crop. Heretofore, several private companies have tried to take irrigation from the Colorado, but have failed just on this point, they could not get rid of this vast amount of rich mud. The Government is going to succeed in doing it.

Area Irrigated, Railroad Facilities, Products of This Section, Town of Yuma, Etc. There will be 73,100 acres of land subject to irrigation by this system, on the Arizona side, and 13,600 acres of the same on the California side of the river; 86,700 acres in all.

The products to be raised on this soil will be all of those described as so easily raised on each one of these New Mexico and Arizona Projects, with this addition: Here, not only as far south as El Paso, but nearer the Pacific, many of the Tropical fruits flourish to finer perfection.

Indeed, grape fruit, dates, oranges and lemons, are claimed to reach the greatest perfection of any spot in America; while grapes, apricots, cantaloupes, watermelons, plums and peaches, tomatoes and celery raised near Yuma have found a greedy market at the highest prices, while the yield is claimed to be more prolific than at any other point.

Yuma is on the main line of the Southern Pacific, and being directly east of San Diego, the most southern harbor of California, and the finest natural harbor on the entire Pacific Coast, it is bound to be the junction point of several more roads, some of which are already in their beginning. A toast recently given by one of her citizens, exclaimed, "Yuma! Queen of the Desert, she sits enthroned upon an Oasis, overlooking the mighty and mysterious Colorado. She has no rival towns nearer than Tucson, 250 miles on her east, and Los Angeles, 248 miles on her northwest; and because of her situation she never will have."

Because of the peculiar conditions found the engineers have had to alter their plans frequently, hence unexpected delays in the work. However, the work is progressing as fast as is consistent with thoroughness and permanency in construction.

Guadalupe County, New Mexico

The Mecca for Land Hungry Farmers

GUADALUPE COUNTY is in the east central part of New Mexico, it is sixty-six miles from east to west and fifty miles from north to south. The Pecos River, one of the largest streams in New Mexico runs through the county. The northern part is somewhat rough and broken. In the central and southern parts the surface is more of a rolling plain, broken by the Pecos river and numerous creeks. The character of the land varies.

Nearly every foot of Guadalupe land is good for grazing, but naturally the best farming land is in the level portions and along the valleys of the Pecos and the streams entering it and the low mesas adjacent. The soil is rich and productive. The immigration to Guadalupe county during the past two years has been very great and has exceeded many other parts of New Mexico. Proof of this fact can be found by visiting the United States land office at Santa Fe and looking over the record of entries.

MECCA FOR HOMESEEKERS. As to original homestead filings it is in the lead and in final proofs also. The farmers who have located around the various growing towns of Guadalupe county are men of good standing and experienced farmers. Therefore they are making a decided success here. New farm houses have been erected on nearly every quarter section and thousands of acres of virgin soil have been ploughed and satisfactory crops are being raised on the same. Thousands of cattle, sheep and horses are raised in this county. The fine range, good water, mild winters and abundance of grass make it an ideal stock country. There are hundreds of cases where men have come into the county with almost nothing and by taking sheep on shares have made fortunes in a few years. Sheep are fed here on the native grasses the year round and are fed nothing else. The expense of keeping consists only of herding, lambing and shearing. The growing of Angora goats is also very profitable. There are thousands of acres finely adapted to this industry.

Farming by irrigation where the land can be put under water by the simplest and cheapest methods has been carried on here for years. There are many fine orchards along the Pecos river. It has also been demonstrated that farming without irrigation can be carried on with success. The last two years has proved beyond question what can be done with this kind of farming. Corn, cane, milo maze, squashes, pumpkins, melons, beans and potatoes were grown in abundance last season. Crops are in good condition this year.

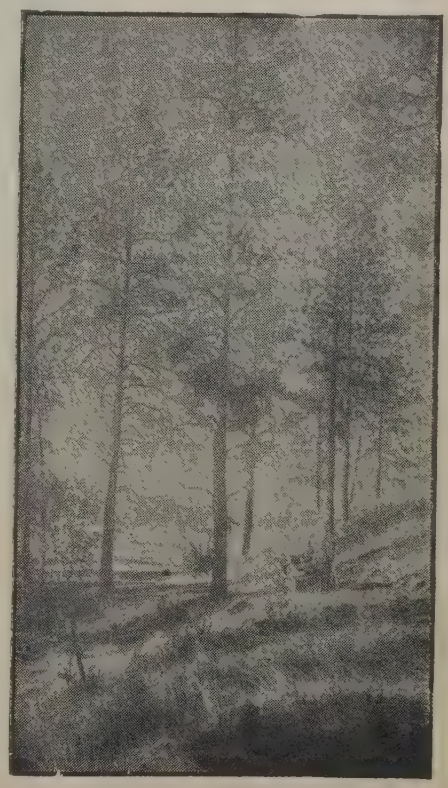
This county is only one day by rail from Kansas City and is consequently ahead of the western counties as far as good markets are concerned. At present the demand at home is greater than the supply and the local markets consume all products at a good price for the farmer.

GROWTH AND DEVELOPMENT. The growth and development of the county during the past three or four years has been rapid. Railroads have been built, farms have been opened, farm buildings have been erected that will do credit to the country and are as substantial and costly as many of the eastern farm buildings. The assessed valuation of Guadalupe County in 1907 was $800,000, and this year, 1908, the assessors returns show $1,800,000, or more than double the assessment of the previous year. This alone is positive proof that this county has been improved and that the population has more than doubled during the past two years. Along the Pecos Valley, north and south of Santa Rosa, the county seat, are fine irrigated farms and orchards. Apples, pears, peaches, apricots, plums, cherries, alfalfa, chile and vegetables are among the crops that do well. The county is noted for its fine large red apples and luscious pears.

There are many natural small reservoir sites in the county, and many acres will be put under irrigation with the flood waters this way. There is plenty of juniper, cedar and pinion timber for fuel and fencing. Fine building stone is in abundance and a good quality of brick is made in the county. A good grade of lime is also made while some mineral and oil has been found. Mines are being developed and immense quantities of copper ore have been discovered. Santa Rosa, the county seat, lies almost in the center of the county at the point where the Chicago, Rock Island and Pacific railroad crosses the Pecos river. Although platted about fifty years ago, it is really only about seven years old. Starting from the days of a railroad construction camp, it has developed into a nice and prosperous city of fifteen hundred people. The town has among its industries eight general stores, a national bank, one of the strongest in New Mexico, three churches, an 8,000 school building, ice plant, bakery, drug store, hotels, two newspapers, lumber yards, etc.

Santa Rosa has a Commercial Club which is actively engaged in promoting the best interests of the town. C. H. Stearns, is president; C. R. Jones, vice-president, and S. S. Moise, secretary. It has neat quarters where frequent meetings are being held and here specimens of the soil, minerals and crops raised around the city are displayed. The Commercial Club has been busy raising funds for the building of a steel wagon bridge over the Pecos river a few hundred feet south of the present railroad bridge, and which will greatly faciliate travel and promote trade between residents on the north and south sides of the river.

The industrial committee of the Commercial Club headed by its chairman, H. B. Jones, cashier of the First National Bank, has a plan on foot to reclaim a tract of over one thousand acres of land a few miles south of the city by means of irrigation. A survey has been made and application for water rights filed. The agricultural development of this tract will mean much in a material way for Santa Rosa.



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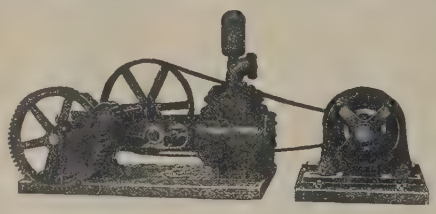

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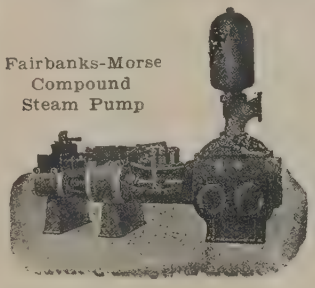

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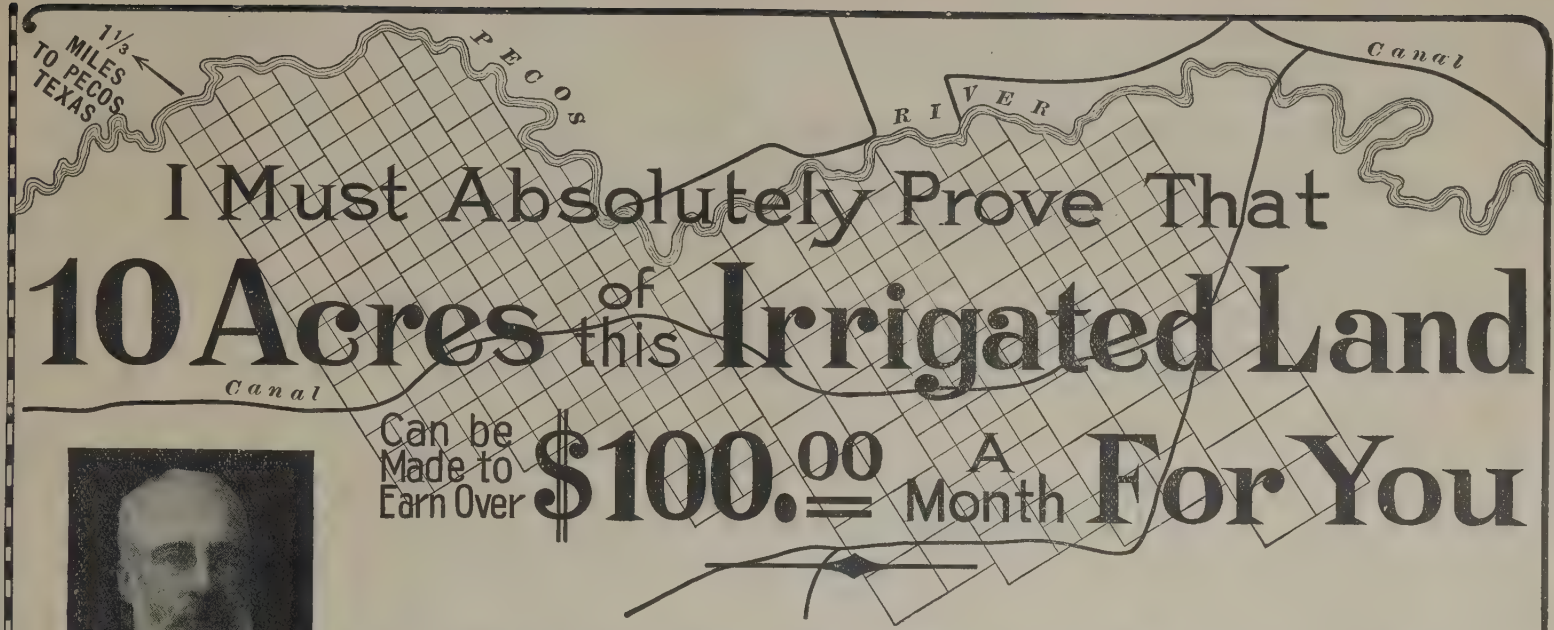

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Any one who is familiar with the results from Texas Irrigated Land will tell you that the safest, surest way to gain a large and permanent income from a small outlay is to get hold of a few acres of Texas Irrigated Land.

But, heretofore, it has required some capital—at least a few hundred dollars—and it has been necessary for the purchaser to go and live on the land and develop it.

Now, my company makes it possible for you to get ten acres of the finest kind of Texas Irrigated Land, all under cultivation, income property from the very beginning, if you can save $3.00 a week.

You can go and live on it — absolutely assured of an independent living from it alone.

Or arrangements will be made to have it cultivated for you for a small share of the crops.

Now, I can and will prove all this from the highest authorites in the land.

All you have to do is—write to me and say, "Prove to me that ten acres of your Texas Irrigated Land can be made to produce an income of from $1,000.00 to $5,000.00 a year."

I have the proof, so read what my company will do for you.

New Safe Land Plan

I will deliver at once to the Citizens' State Bank of Barstow, Texas, a Warranty Deed to ten acres of the land of the Pecos Valley Land and Irrigation Company as per the subdivision of the Company's property made by John Wilson and filed for record with the County Clerk of Ward County, Texas.

I will deliver at once to you, one of our Secured Land Contracts for the Warranty Deed at the Bank—on the contract appears a certificate signed by an Officer of the Bank and certifying that the Bank has your deed and will deliver it to you according to the terms of your Secured Land Contract. The Bank acts as an independent agent for both of us—to guarantee fair play.

You must pay $3.00 a week, or at the rate of $3.00 a week in monthly, quarterly, semi-annual or annual payments. Or you can pay as much faster as you like.

At the end of each year—if you take more than a year to complete your payments—you will be credited with 5 per cent per annum on the amount you have paid.

$15 down and $3 a week paid regularly, and the interest credits, will mature your Contract in a little over two and three-fourths years.

But you can mature your Contract by paying the same total amount, $483, in a day, a month, six months, a year, or in any less time than 2¾ years, and whenever your regular receipts and your interest allowance credit receipts total $483, all you have to do to get your land is to take or send your receipts and your Contract to the Citizens' State Bank at Barstow, Texas, together with twenty-eight vendor lien notes each for $39, payable one every three months for seven years.

The Bank will then give you your Warranty Deed to the land, which, according to the Contract and the Deed, must be fully irrigated and all under cultivation.

Remember, this is ten acres of land which I must first prove is capable of producing an income of from $1,000 to $5,000 a year.

Safeguarded

The Bank will deliver your deed direct to you when your $3.00 a week and interest credits total $483.00.

It Doesn't Take Long

You get this land for $483, which you can pay in less than three years—$15 down and $3 a week—and you then have only four $39 notes each year for seven years to pay out of your income.

Can you hope in any other way, so safe and sure as this, to have so large an independent income in so short a time?

I believe the purchase of Texas Irrigated Land to be the best way for a man of small means to make himself independent. And I believe I am qualified to pass judgment, as I have been interested in Irrigation matters locally and nationally for fifteen years.

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And I believe the happiest man these days is the man with the little ten-acre irrigated farm—(President Roosevelt says, "Even five acres is enough to support a family and keep it busy.")

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His income is practically untouched by "financial depression."

His living and peace of mind are not dependent upon the whim of any man.

He is king in his own little domain.

He can make his little ten acres earn as much as a quarter section (160 acres) unirrigated, would produce—as much as between twenty and eighty thousand dollars in cash would bring, loaned out at 6 per cent.

He has his close neighbors, his telephone, good roads, schools and churches—in fact, all the comforts and conveniences of life that come with the prosperous close-knit community, though they pass by the great isolated farm.

The land I want you to buy is all good rich soil, irrigated from Canals and Ditches already constructed in the most approved modern fashion and carrying an abundant supply of water taken from the ever-flowing Pecos River.

It is within a few miles of Barstow, Texas, and Pecos City, Texas, (the two towns are only 6½ miles apart—the land lies between the towns and a little to the north) and served by the Texas & Pacific Railway and the Pecos Valley Line of the Santa Fe System.

With rich soil, a splendid climate and the uncertain quantity—moisture—eliminated, agriculture and horticulture can here be scientifically carried on to the splendid profit of the land owner.

The abundant crops of large and in every other way superior hays, grains, cotton, vegetables and fruits are equaled in only a very few favored spots.

The justly celebrated Barstow Grapes are considered by many to be even better—variety for variety—than those raised in Southern California—and we are 1,200 miles nearer the great Eastern market. But all this is the merest outline of what I desire to show you in detail. I am only attempting to make it clear to you that you can have an assured independent living income in less than three years if you can possibly save $3 a week. I have promised to submit the proof. All you have to do is write for it. Will you do that today, even if you can't commence right away? I want the address of every man or woman who is willing to save $3 a week if I can prove that the result will be financial independence in less than three short years.

There is nothing philanthropic about this proposition, but I especially want to hear from the wage-earners. I have worked for fifteen years to develop this Irrigation System and this community. It would be gratifying to me to have those who most need it reap the benefits of my labors.

It will be more convenient for you to address me at St. Louis, and I am equipped there to best answer you.

GEORGE E. BARSTOW, President
Pecos Valley Land and Irrigation Company, of Barstow, Texas.
848 MISSOURI TRUST BLDG. - - - - ST. LOUIS, MO.

THE GREAT WESTERN SUGAR COMPANY

LONGMONT FACTORY

FACTORIES

FORT COLLINS LONGMONT
LOVELAND GREELEY
BRUSH FORT MORGAN STERLING
WINDSOR EATON

ALL IN THE STATE OF COLORADO

Daily Capacity, 7,200 Tons of Beets

1907

Acreage	76,000 Acres
Paid Farmers for Crop	$4,754,000
Paid in Wages	$1,400,000

The American Fuel Co.

MINERS AND SHIPPERS OF

American Block Coal

SALES OFFICES

Gibson, New Mexico
Room 4, City National Bank Building, El Paso, Texas
508 H. W. Hillman Bldg., Los Angeles, Cal.
1217 Broadway, Oakland, Cal.
16th and Wisconsin Streets, San Francisco, Cal.

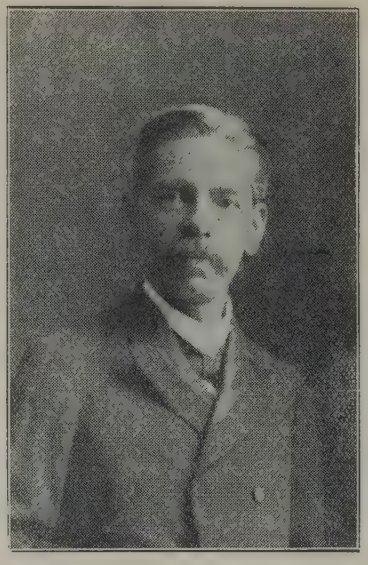
Visitors to the Irrigation Congress Are Cordially Invited to Visit Our Exhibit

FOR VALLEY LANDS

OR :: INSIDE :: REAL :: ESTATE

Also Investments of Magnitude From First Hand Address

Felix Martinez



El Paso Texas

Residence of Felix Martinez, El Paso Valley

Map of the New Mexico Central RR

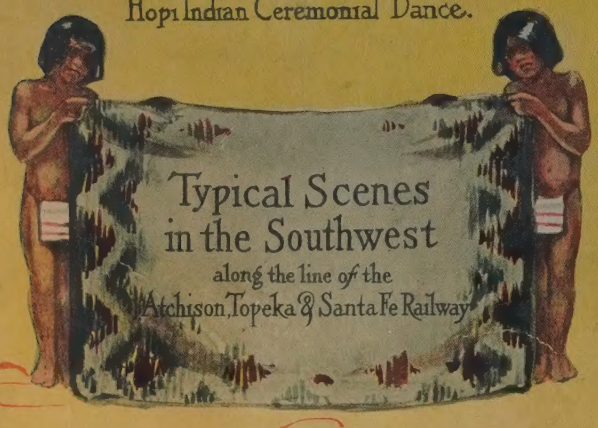
Embracing the =

Santa Fe Central Ry.
Albuquerque Eastern Ry.
New Mexico Fuel & Iron Co.
Torrance, Roswell & Gulf Ry.
Durango, Albuquerque & Gulf Ry

SHORTEST LINE TO CITY OF MEXICO
SHORTEST LINE TO KANSAS CITY & THE EAST

El Tovar Hotel, Grand Canyon of Arizona.

Hopi Indian Ceremonial Dance.



Petrified Forest.

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